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COAL AGE

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Cool Treatment
FOR HOT BEARINGS

SUN MINE LUBRICANTS

Reduce Bearing Temperature on Vital Power Unit . . . Last Twice As Long

The tremendous task of delivering heat, power and light for the nation's war plants . . . of furnishing heat for America's homes . . . and filling the gap caused by other fuel shortages is the problem that faces the coal industry. Everything must be done to keep coal production going at its peak . . . and Sun Engineers are proud to be doing their part.

When a large Pennsylvania anthracite operator had trouble with overheating of the ring-oiled bearings in electric motor equipment, a Sun Lubrication Engineer was called in. He found that the bearings were running so hot that they had to be cooled with air . . . that excessive oil consumption was keeping lubrication costs high.

SUN SOLNUS Heavy Medium Oil was recommended to do the job. Bearing temperatures dropped immediately . . . oil lasted twice as long, with no signs of deterioration . . . lubrication and maintenance costs fell off sharply.

Let Sun Mine Lubricants, plus the "know how" of a Sun Engineer help solve your problems. His recommendations may prove an increase in efficiency, savings in maintenance costs and protection to vital equipment. Write to . . .

SUN OIL COMPANY • Philadelphia
Sun Oil Company, Limited, Toronto, Canada

SUN INDUSTRIAL PRODUCTS

SUNOCO
HELPING INDUSTRY HELP AMERICA

In war or peace
B.F. Goodrich
FIRST IN RUBBER

B. F. Goodrich announces

First and only grommet-type wire V belt

For use where others have failed and where
V belts have never before been possible

Transmits more h. p., has
greater strength, no stretch,
needs less maintenance

THIS new V belt is made with the grommet principle, a B. F. Goodrich development that gives greater strength, and transmits more horsepower for a given size of belt.

Ordinary wire V belts are made by winding a continuous wire around a drum, then cutting into narrow sections to form the individual belts. Thus in ordinary belts there is a point on each side where the wire is close to the edge. The B. F. Goodrich grommet is made by forming wire cable into a loop, then winding it spirally on itself up to the needed

size. It's endless; in the belt it is always the same distance from the edge (wires will never be exposed by slight wear); it has less stretch than small individual cables, more strength for a given amount of wire. Thus it transmits more horsepower for a belt of given size.

The wire grommet, spirally wound in one direction, is covered by cord spirally wound in the other direction. Thus each grommet is balanced—and each belt is balanced.

Strongest V belt ever made

This new principle makes the strongest V belt ever produced in proportion to size and weight. The

well-known V belt advantages of efficient power transmission, low maintenance, long trouble-free life, quiet and clean drives, less weight are now available for many drives which have always had to put up with heavier, costlier methods.

If you have drives on which other belts have failed—or drives on which lack of strength has made former V belts impractical—write B. F. Goodrich. Our belt specialists will help you engineer this revolutionary new belt to your drives to give you greater power efficiency, and save you money, trouble and production time. *The B. F. Goodrich Co., Industrial Products Division, Akron, O.* 

B. F. Goodrich

RUBBER and SYNTHETIC products

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NO DO ONE THING

... and do it supremely well

Over 200 years ago Antonio Stradivari made violins in Cremona, Italy. To this day no other violins compare with the Stradivarius for supreme tone quality. For 25 years Hulbert has been doing one thing . . . specializing in making Grease solely for lubricating coal mining equipment. Its Quality today is incomparable.

HULBURT OIL & GREASE COMPANY

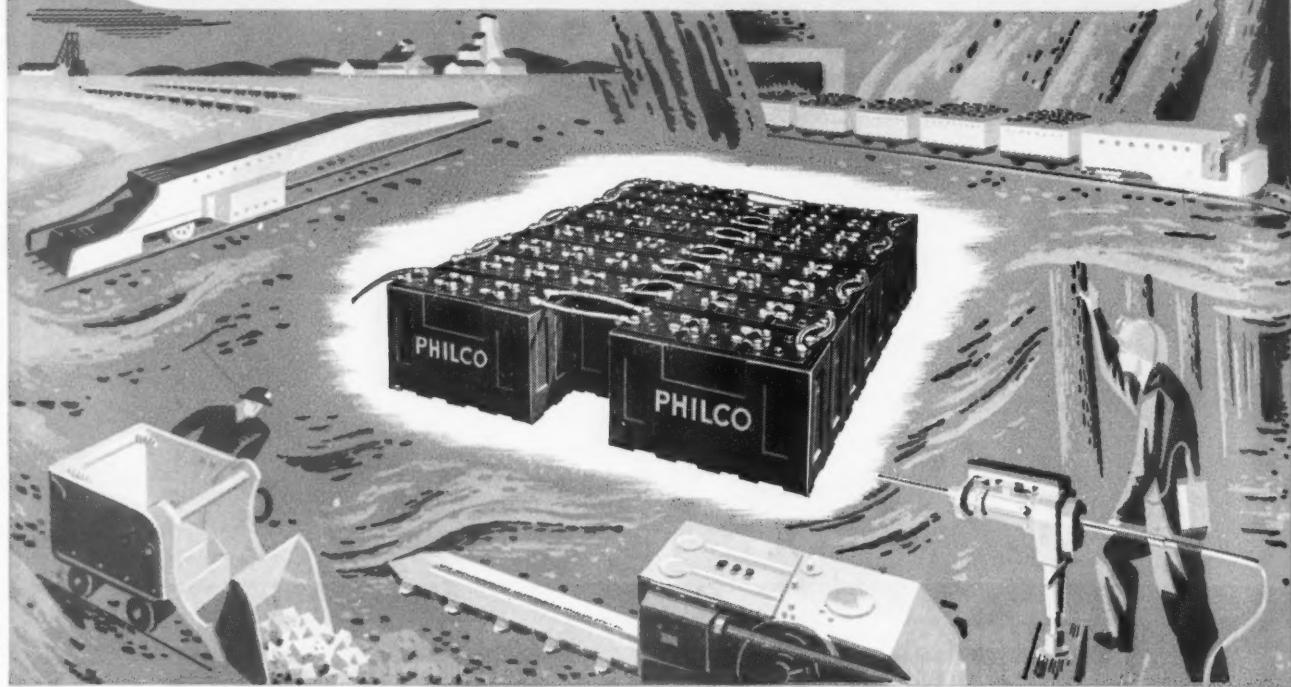
Specialists in Coal Mine Lubrication

PHILADELPHIA . . . PENNSYLVANIA



HULBURT
Quality **GREASE**

**THERE'S EXTRA WALLOP BUILT INTO
EVERY PHILCO LOCOMOTIVE BATTERY!**



**PHILCO BATTERIES ARE ENGINEERED TO DELIVER
SUSTAINED HIGH VOLTAGE, HOUR AFTER HOUR!**

It takes a rugged locomotive battery—one that will deliver high voltage hour after hour—to keep mine production on top of war schedules.

But you can count on a Philco to do the job, and do it at lower haulage cost per ton! Every Philco cell is engineered to give you *extra wallop* not only when the battery is fully charged but right up to the time it goes back to the charging room.

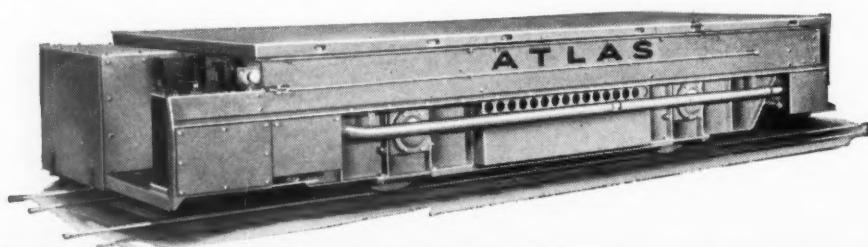
The sustained high voltage you get in a Philco battery hauls more tons per charge...keeps the operation going at high speed!

There's maximum capacity in a Philco, too—coupled with long productive life. Together these Philco features add up to the most efficient battery you can buy for today's mining service.

Write for the latest Philco Mine Battery catalog.



PHILCO CORPORATION, STORAGE BATTERY DIVISION, TRENTON 7, NEW JERSEY



Replace with **PHILCO** *Mine Batteries*

C O N T E N T S

VOLUME 48

SEPTEMBER, 1943

NUMBER 9

COAL AGE

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Please change my address on Coal Age

From

To

Signed

COMING COAL AGE ATTRACTIONS

• Two phases of transportation of coal—underground and river—will be the subjects of articles scheduled for early Coal Age publication. The material on underground coal movement will stress new methods for improving the ton-mileage of locomotives and cars. The river transportation article, by M. Lelyn Branin, Office of the Bituminous Coal Consumers' Counsel, tells how over 24 percent of the total bituminous coal tonnage is moved by

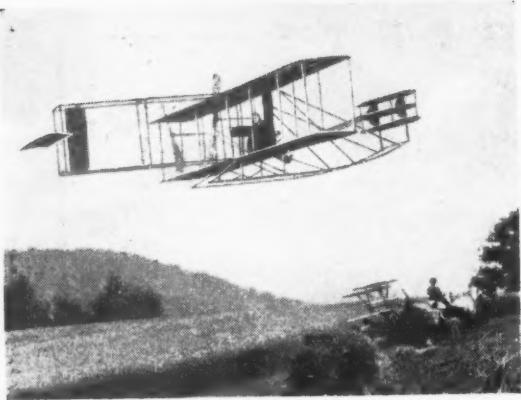
water and gives the details of such movement on the Ohio, Mississippi and Black Warrior river systems.

• Coal inspection at a leading bituminous operation is the theme of a pithy descriptive story also on the agenda for early Coal Age use. Going underground again, the editors have in preparation a list of timely articles on the various phases of mechanical mining with different types of machines.

• Stripping is the subject of a comprehensive series of articles now being worked up. These articles will analyze the methods used in drilling, shooting and otherwise preparing overburden, stripping with various types of equipment, loading coal, transportation and road building, electrification, drainage and other activities involved in uncovering coal and getting it to the preparation plant. The first will appear in an early issue of Coal Age.

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• COAL AGE



**CONSTANT IMPROVEMENT,
FOR 35 YEARS, HAS
MADE THE AMAZING
PLANE OF TODAY!**



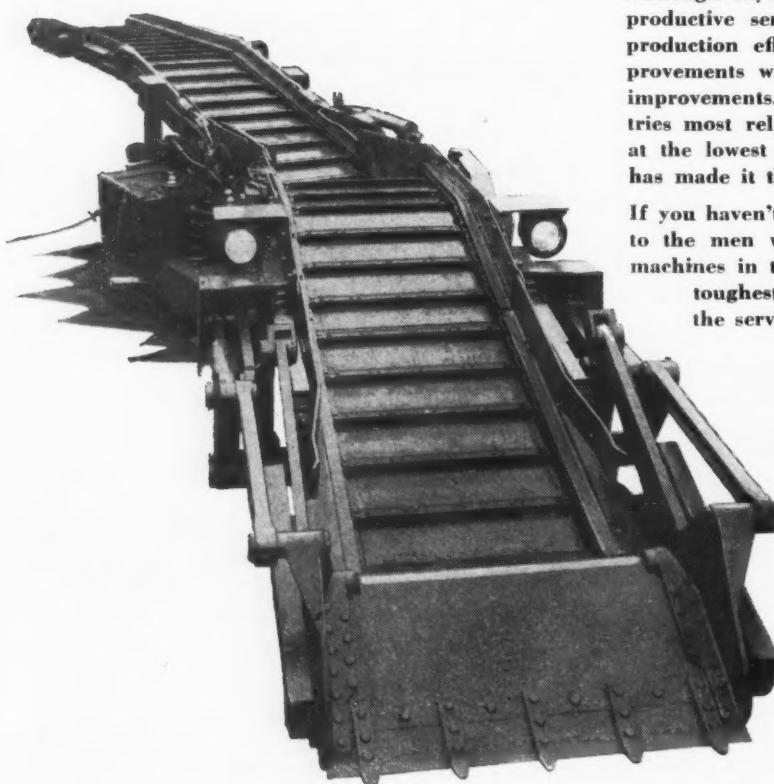
*—and Mister, you can make this
same statement about the Myers-
Whaley Loading Machine, too!*



Just about the time the Wright Brothers achieved success with their first plane, Myers-Whaley was installing the first commercially successful underground mechanical coal loader. The basic characteristics, or principles of both have never changed, yet amazing improvements have made them vastly more efficient today.

Although Myers-Whaley loaders of 20 years ago still are in productive service, they cannot compare, of course, with the production efficiency of the modern Whaley "Automat". Improvements within the past few years, and particularly recent improvements, have made the "Automat" the mining industries most reliable loader for consistent, maximum production at the lowest cost per ton. Its exclusive shovel loading action has made it the safest loader known.

If you haven't seen the latest Whaley "Automat" in action, talk to the men who use them. Where there are other makes of machines in the same mine, you'll find the "Automat" on the toughest jobs . . . on the longest grinds . . . wherever the service is hardest. Ask the operator why?



MYERS-WHALEY

*"Mechanical Loaders Exclusively
For Over 35 Years"*



DRILLING EQUIPMENT

for INCREASED PRODUCTION AT LOWER COST...

HELP FROM Specialists

Our specialists have made many recommendations that have simplified former drilling problems and helped producers to cut drilling costs. These expert technicians can be valuable to you now in your efforts to speed up and maintain coal production schedules. Their services involve neither cost nor obligation. You are invited to submit your desires, troubles or problems in writing. Perhaps we can help you.

TOOLS FOR HAND HELD DRILLS

Our Safety Hex shank and drill socket combination puts complete feed control and a new feeling of security in the hands of the driller. No driller, once having experienced this new security, would be without it. From our numerous types, you will find the solution of your problem.

TOOLS FOR POST AND MACHINE MOUNTED DRILLS

The COALMASTER line of drilling tools is made in complete sets specifically designed for all powder sizes from $1\frac{1}{8}$ " to 2", all CARDOX and AIRDOX shells from $1\frac{1}{4}$ " to $3\frac{9}{16}$ ", and all Hydraulic cartridge requirements.

TOOLS FOR STRIP PIT DRILLS

The Hexanspeed Coupling is a quick make and break auger coupling that has reduced auger changing time to the minimum and has speeded up hole production 10% to 30%. Correct drill head, bit and auger design combine to place hole production on a new level of economy.



COALMASTER

BLAST HOLE DRILLING

Tools

CENTRAL MINE EQUIPMENT CO.

ST. LOUIS, MO.



**"With me you'll get
more tonnage
from every shift"**

TODAY the battle cry of production is for more tonnage per shift to meet this war-year's need for 665,000,000 tons of anthracite and bituminous coal.

Helping to do this job is Du Pont "Lump Coal" C—a permissible, which due to its wide spreading action often permits the use of fewer drill holes—saving time and explosives. Its slow heaving action rolls the coal forward away from the face so that it can be easily handled by mechanical loaders. And, finally, because it is a strong but slow explosive, with less shattering effect on the coal, it produces a larger percentage of good firm lump.

For more tonnage per shift at less cost—adopt "Lump Coal" C. Write or call E. I. du Pont de Nemours & Co. (Inc.), Explosives Department, Wilmington, Delaware.

TIPS FOR BETTER BLASTING

Stemming is required practice in coal mining. Good stemming materials for small diameter holes are (1) a mixture of sand and plastic clay; (2) clay; (3) sand. All should be used in a damp state. Bug dust, paper bags, sawdust and other combustible materials should never be used for stemming.



BACK THE ATTACK
WITH WAR BONDS
INVEST IN VICTORY

DUPONT
REG. U. S. PAT. OFF.

"LUMP COAL" C

IT'S NEW THE O-B TYPE FG GAS-PROOF SPLICE BOX

-An Approved Means
of Sectionalizing
Trailing Cables in
Gaseous Areas



APPROVED BY THE U. S. BUREAU OF MINES

Only Six Bolts to Tighten for Positive,
Gas-Tight Splice.

Glands Assembled and Sealed On Cable
Ends — No Need to Repack in Making or
Changing Connections.

Permanent, Boltless Safety Ground Connection.



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Ohio Brass Company • Mansfield, Ohio

Yes, I'd like to know more about the new O-B Type FG Gas-
Proof Splice Box. Please send complete details and cataloging
information to:

NAME _____

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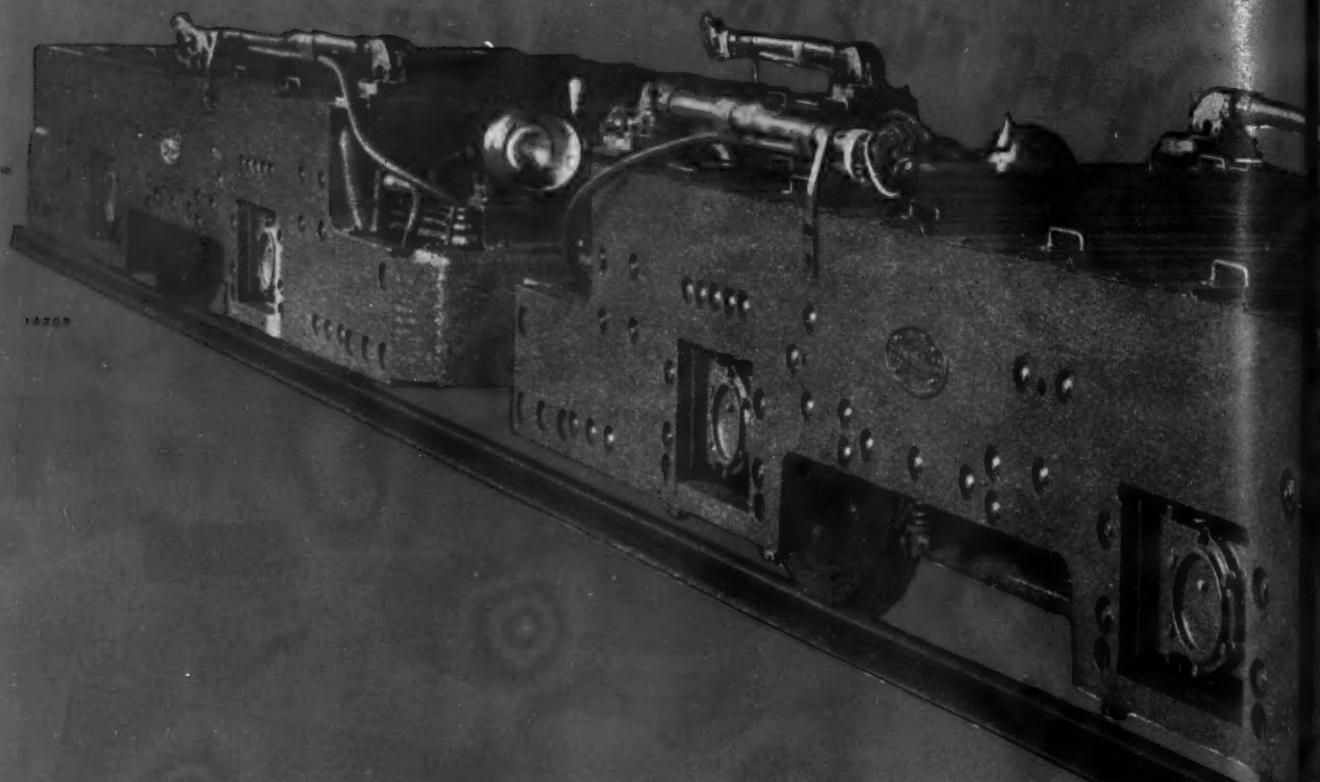
Ohio Brass

MANSFIELD, OHIO

Canadian Ohio Brass Co., Ltd., Niagara Falls, Ont.

KEEP BUYING WAR BONDS

High Motor Capacity for



GOODMAN TANDEM LOCOMOTIVES

This 26-ton, 400 horsepower tandem unit will capably handle heavy underground hauls. Outstanding features of this powerful unit:

- higher horsepower than possible with single locomotive of same weight
- semi-electro pneumatic control with automatic transfer switch
- straight air brakes, self-locking hand brakes
- roller type motor axle bearings
- roller type journal bearings
- transverse equalizers
- air sanders
- externally ventilated motors
- may be arranged for separate or permanent tandem operation

GOODMAN MANUFACTURING COMPANY

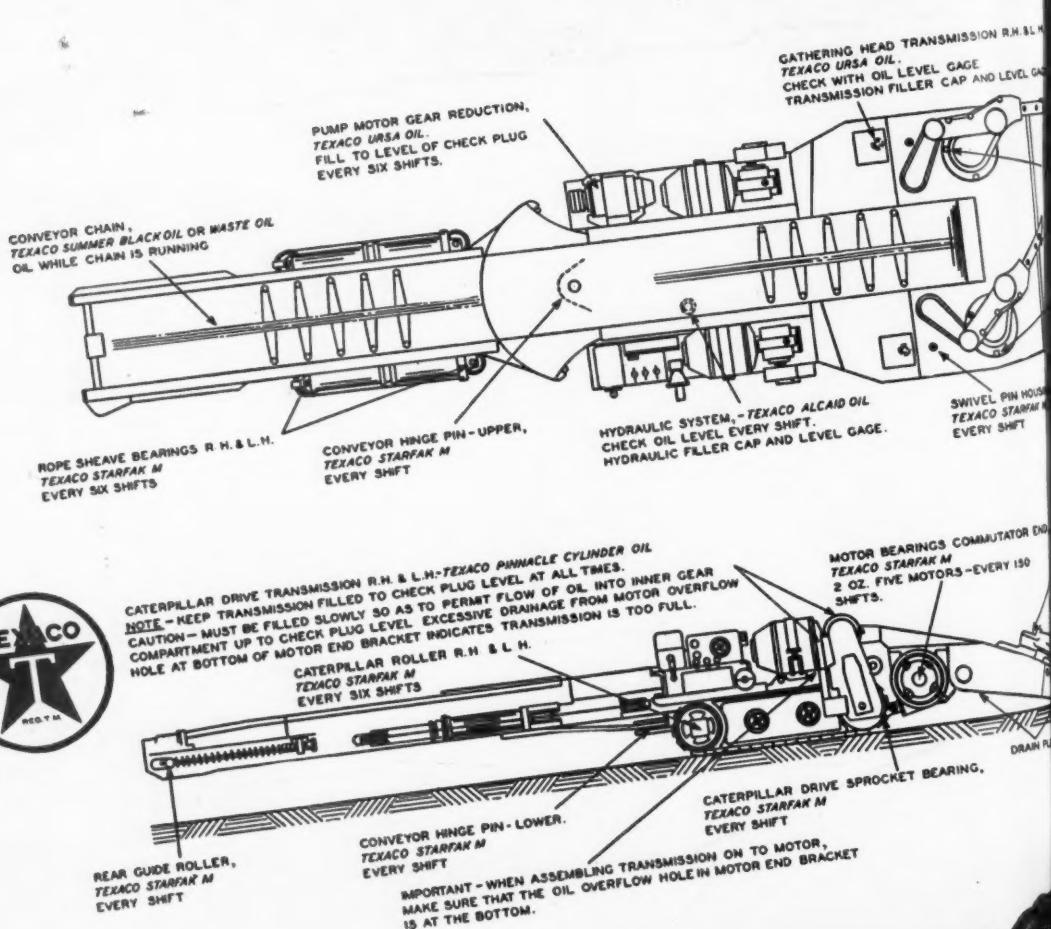
er Heavy Main Line Loads



NY HALSTED STREET AT 48TH • CHICAGO, ILLINOIS

HOW TO INCREASE

TEXACO MAINTENANCE LUBRICATION CHART JOY 14 BU LOADER



Full-size, 12" x 18" Charts are available
covering prominent makes of underground
machinery. Order by make and model to-
day, using Company letterhead, please.



TEXACO

E Tonnage!



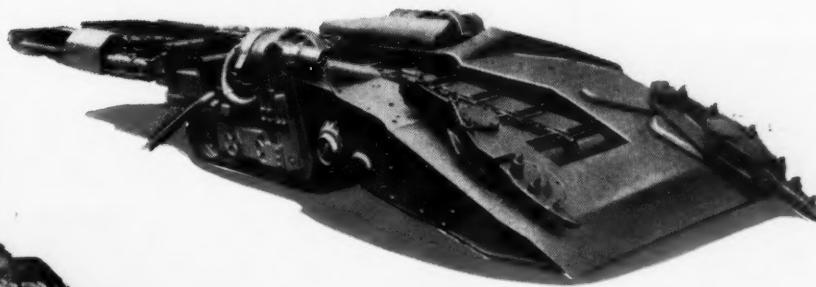
STRIVING for every possible ton of production to meet the country's war needs, the coal mining industry is pushing the output of its mechanized equipment. Cutters, loaders, locomotives must be kept on the job continuously, despite skilled manpower gone away to war.

The Texas Company offers operators an effective service that will help increase tonnage . . . Texaco Maintenance Lubrication Charts.

These Texaco Maintenance Lubrication Charts show clearly *where, when and with what* lubricant to service each lubrication point of various cutters, loaders, locomotives, etc. . . . with lubricants approved by the manufacturer.

Texaco Maintenance Lubrication Charts, 12" x 18" in size, displayed at all lubrication stations, will help to keep your equipment out of the repair shop and on the job, producing more coal. Order the Charts you need by make and model, addressing—

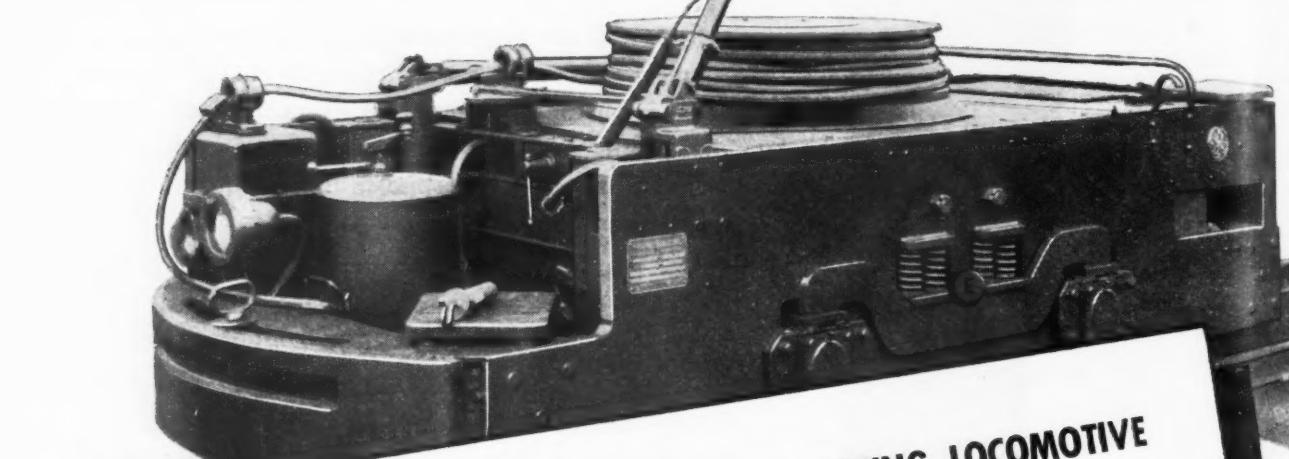
The Texas Company, *National Sales Division, Dept. C,*
135 East 42nd Street, New York 17, N.Y.



Lubricants

FOR THE COAL
MINING INDUSTRY

PULLING POWER



G-E 8-TON "SEALED-EQUIPPED" MINING LOCOMOTIVE

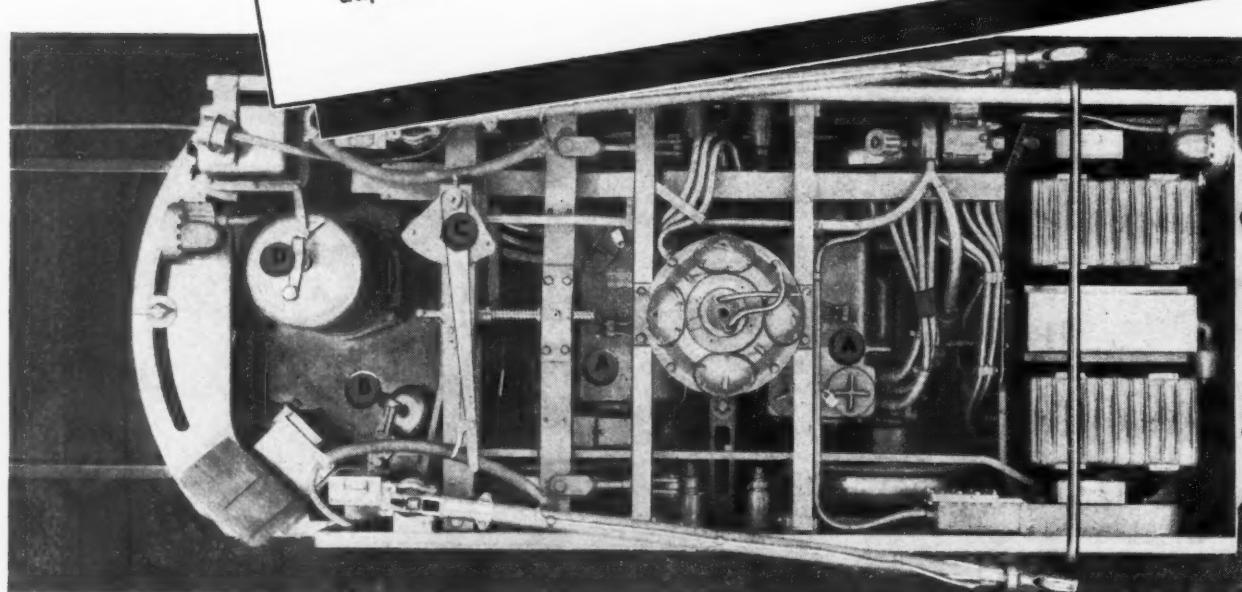
A. Motors centrally hung for good balance

B. Ample space for operator

C. Quick-acting lever brake, easily adjusted

D. One-hand reversing and plugging controller—readily accessible for inspection

E. Side-equalized coil-spring suspension—good balance—stays on the track



to Speed up

NEW BITUMINOUS TONNAGE

Facing the necessity of opening new bituminous mines quickly and safely with limited man power, you'll find General Electric's popular 8-ton "sealed-equipped" gathering locomotive offers definite advantages in:

Continuous "On Track" Performance

Security in Gassy Areas

Low Servicing and Maintenance Costs

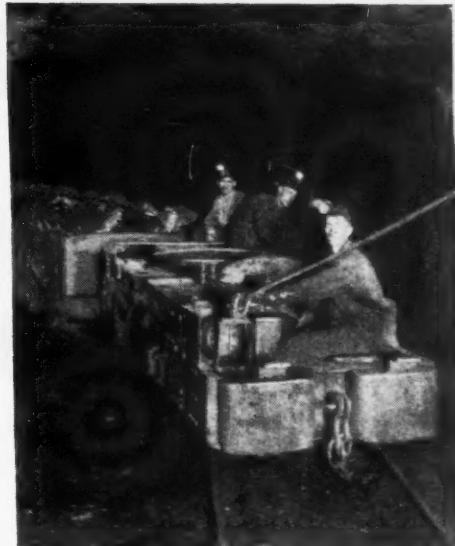
This locomotive is of explosion-proof construction. Its centrally hung motors and side-equalized coil-spring suspension produce fine balance, eliminate teetering, track pounding, derailments.

The unit's quick-acting lever-brake and single-hand controller mean faster, more accurate spotting of cars and locomotive, give added assurance of a continuous supply of empty cars at the mine face.

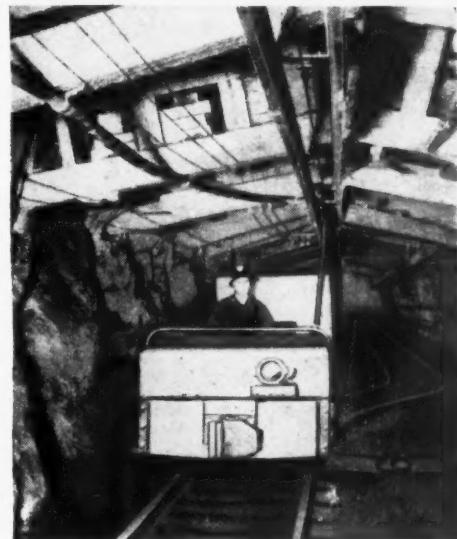
The long service life built into bearings, motors, controller, and cable-reel equipment results in lower maintenance cost and less time out for servicing.

Performance? Repeat orders from three large operators for 97 sealed-equipped locomotives tell the story. So does the preference of the entire industry, which is installing almost as many locomotives of this type as all others combined. *General Electric Co., Schenectady, N. Y.*

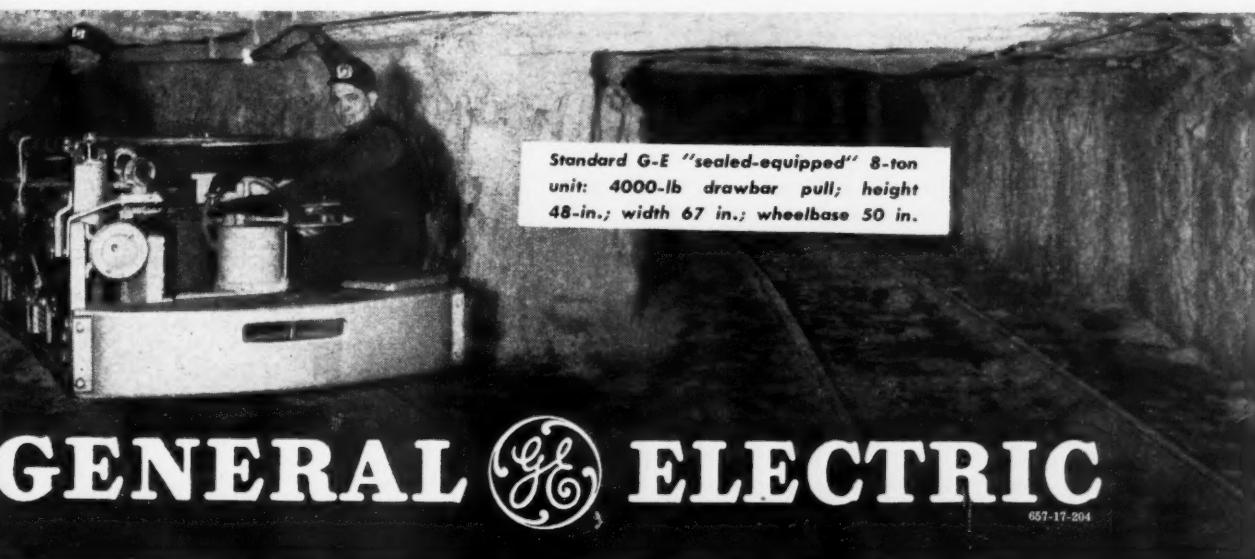
WHATEVER YOUR CONDITIONS
THERE'S A G-E LOCOMOTIVE TO MEET THEM



G-E 8-ton unit with electric cable reel



G-E 8-ton mine-type trolley locomotive



Remember these facts about Cor-Ten when you plan for tomorrow

U·S·S Cor-Ten can be used to improve the efficiency of any type of mine car

1. U·S·S COR-TEN is strong. It has a minimum yield point more than 50% higher than structural open hearth steel.
2. COR-TEN has unusually high resistance to atmospheric corrosion—4 to 6 times that of plain steel—2 to 3 times that of copper steel. That's important in coal mine equipment.
3. COR-TEN is easy to handle—is readily fabricated by usual shop methods and equipment.
4. COR-TEN is tough and hard-wearing. Has 1/3 greater resistance to abrasion than mild steel. Is highly resistant to shock and impact.
5. COR-TEN is a versatile steel. Lends itself well to wide variations in design to meet local operating conditions and users' preferences.
6. You pay no premium when saving weight with COR-TEN. It will safely reduce weight with little or no increase in cost.



THIS war isn't going to last forever. When it is over, the equipment you have had to "get by" with for the duration will be due for serious scrutiny.

Much of it will have to be discarded because it is worn out. A lot of it will be behind the times from an efficiency point of view. It just won't be good enough for the tougher competition of peacetime operation when *cost* of production again assumes its position of top importance.

That's why now is a good time to look into the economies of operation and maintenance that construction with U·S·S COR-TEN assures.

If you have been using COR-TEN mine cars—built before COR-TEN was limited to direct war production—you don't have to be told what this equipment will do. You know how COR-TEN cars step-up output by increasing hauling capacity . . . how they lower operating costs because they weigh less . . . how their greater stamina and high resistance to corrosion keep maintenance low.

After seeing what the 10,000 COR-TEN cars now in service have done during this war, we can't help but feel that U·S·S COR-TEN will do even more in tomorrow's equipment. The important thing is that you get the facts and plan now to use COR-TEN, when it is again available, to make your mine cars lighter and stronger, longer lasting and more profitable to operate. We will be glad to give you information that will help you in this planning. It's not too early to find out what COR-TEN has to offer.

AMERICAN STEEL & WIRE COMPANY
Cleveland, Chicago and New York

CARNEGIE-ILLINOIS STEEL CORPORATION
Pittsburgh and Chicago

COLUMBIA STEEL COMPANY, San Francisco
NATIONAL TUBE COMPANY, Pittsburgh

TENNESSEE COAL, IRON & RAILROAD COMPANY
Birmingham

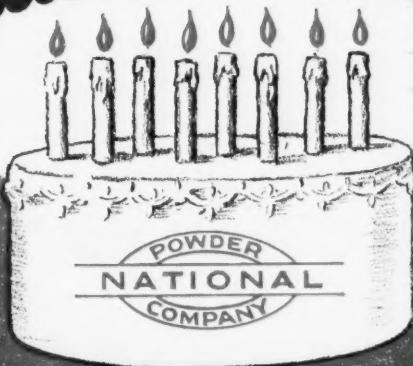
United States Steel Supply Company, Chicago,
Warehouse Distributors

United States Steel Export Company, New York



UNITED STATES STEEL

Starting our 8th Year
Reputation-building of



NATIONAL
POWDER COMPANY
IS NOW STARTING ITS
8 th YEAR
OF MANUFACTURING INDUSTRIAL HIGH EXPLOSIVES.

SEVEN years ago we had four explosives on the permissible list. Today we have ten permissible powders, all of which are on the active permissible list.

Seven years ago not one coal company standardized on any National powder. Today hundreds of mines, both anthracite and bituminous, are using National permissibles exclusively.

Each year an increasing number of coal companies are standardizing on National powders.

Annually millions of pounds of National permissibles are being used in the deep mines of Indiana, Kentucky, Maryland, Ohio, Pennsylvania (anthracite and bituminous), Virginia and West Virginia.

The reasons are modern formulae and no intermediate storage between manufacturing and the operator's magazine.

NATIONAL POWDER COMPANY

ELDRED, McKEAN COUNTY, PENNSYLVANIA
Manufacturers of High Explosives
for all Industrial Purposes

1935

1943

NOT LIVING ON OUR REPUTATION BUT BUILDING IT

WHAT HAPPENED TO THE BATTERY WHEN THE LOCOMOTIVE RAN WILD?



Arriving at a mine, an Edison field engineer heard that a locomotive had run wild down the underground slope and cracked up.

Meeting the mine engineer, he asked: "What happened to the battery?"

The mine engineer replied: "They gathered up the cells, took them to the shop, repaired the trays and put the battery back on the locomotive. As far as I know, it is as good as ever."

No engineer writes battery specifications to stand up against accidents like this. But it takes such an accident to dramatize the dependability of Edison Alkaline Batteries.

Though their long life and low operating cost are important considerations, dependability is the prime reason why engineers specify Edisons.

Some of the exclusive features which insure dependability in Edison Alkaline Batteries are listed in the column at the right. Edison Storage Battery Division, Thomas A. Edison, Incorporated, West Orange, New Jersey.

ADVANTAGES OF THE EDISON ALKALINE BATTERY IN MINE LOCOMOTIVES

★ It is durable mechanically. High strength steel construction is used in the container, grids, pole pieces, etc. The electrolyte is a preservative of steel. It requires no renewal of separators throughout its long life.

★ It withstands temperature extremes. It is not damaged by freezing. Free air spaces on all sides of all cells provide ventilation for rapid cooling under high temperature conditions.

★ It is free from ordinary battery troubles. It is not subject to sulphation, shedding of active material, buckling of plates, jar breakage or other common causes of battery failure.

★ It is foolproof electrically. It may be short-circuited, over-charged, over-discharged, or even accidentally charged in the reverse direction without injury.

★ It can be charged rapidly. It may be charged at full normal rate throughout the entire length of charge. It requires no equalizing.

★ It does not require critical adjustment of charge rates. It can be charged directly from the d-c mine power supply. It has no finish-rate limitations.

★ It is simple to maintain. Merely charge adequately, add pure water, keep clean and dry.

★ Its tray assembly and cell connections are extremely simple.

★ Its life is so long that its annual depreciation is less than that of any other type of storage battery.

Edison
ALKALINE BATTERIES

UP AND DOWN
THE MOUNTAIN
FOR 15 YEARS...

WITHOUT A
BEARING
FAILURE



General view showing cars at the Montcoal Mine.

That's the record of the Timken Bearing Equipped monitor cars at the Montcoal Mine of the Colcord Coal Company, Raleigh County, West Va.

These cars are used to lower the coal down the mountainside from head house to tipple by gravity, the descending loaded car pulling up the empty. The cars are from 10 to 13-ton capacity and the use of Timken Bearings on the axles has proved to be an important factor in preventing wrecks on the steep descent because Timken Bearing Equipped wheels turn smoothly—never stick. Further advantages are the extending of lubrication periods and reduction of maintenance attention.

Does it pay to operate Timken Bearing equipped mine cars? The experience of more than 1000 mine operators is your best answer. The Timken Roller Bearing Company, Canton, Ohio.



Timken Bearing Equipped monitor car ending descent. These cars were built by Phillips Mine & Mill Supply Co., Pittsburgh, Pa.

Post-war
competition will be
severe. Prepare to
meet it now; redesign
your equipment to
use more Timken
Bearings.

TIMKEN
TRADE-MARK REG. U. S. PAT. OFF.
TAPERED ROLLER BEARINGS



GOULD FACTORY-BACKED SERVICE AT KEY POINTS AVOIDS COSTLY DELAYS, MAKES QUICK REPAIRS POSSIBLE

• Speed is the essence of today's production efforts. This has added new strains on men and equipment. In hurrying to make delivery dates machines are forced to new highs, with the result that breakdowns and accidents do occur. Storage batteries are no exception to this rule.

Realizing the need for quick repairs Gould has created a special factory-backed service at key points throughout the United States. Through the completeness of Gould equipment, and the know-how of the eight Gould factories, injured batteries will again be on the firing line as good as new, with a minimum of delay.

GOULD STORAGE BATTERY CORPORATION, DEPEW, NEW YORK

Builders of industrial batteries for every application. Sales and service offices in principal cities of the U.S.A. Factories at Depew, N. Y., North Bergen, N. J., Dallas, Atlanta, Chicago, St. Paul, Leavenworth, Los Angeles



FOR EXCELLENCE IN STORAGE BATTERY PRODUCTION AT DEPEW PLANT

GOULD

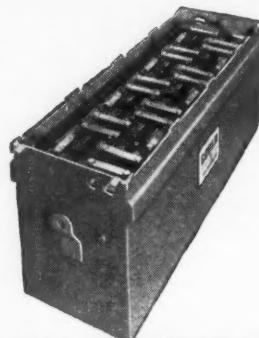
Since 1898 THE BATTERY PICKED BY ENGINEERS

THE SAGA OF A TRUCK

► It happened on the swing shift. Perhaps it was the poor light, or it may have been one man's endeavors to cut a corner, hoping to save a few second's time. In any event, there was a crash and the sound of cuss words out of the darkness. A platform truck has skidded, and gone over the edge.

By herculean efforts the crew managed to get the cases into the cars and the order left as scheduled. The platform truck, however, was much the worse for wear. Repairs to the truck could be made in the factory shop, but the damaged battery was the bottleneck.

The superintendent decided to "Call Gould". A Gould service man was soon on the spot. All that could be salvaged of the wrecked battery was placed on a fast truck and rushed to the nearest Gould plant—one of the eight strategically located to serve American industry. There complete repairs were made, and less than 72 hours later the truck was again in operation.



SPECIFY GOULD KATHANODE
The original spun glass
battery tested by 20
years of actual service.

Rated Conservatively . . .
Goulds equal or exceed in
capacity any battery of
comparable size and cell
structure.

Keep charged elements wet. When an element is exposed to the air for any length of time, you will notice a steaming action taking place. This is caused by the oxidation of the sponge lead in the negative plates. It is a quite rapid chemical reaction with the oxygen in the air and results in the generation of considerable heat, as well as the loss of charge in the negatives.

Whenever it is necessary to remove or otherwise expose an element of a battery, it is essential that it be promptly immersed in clean water or battery electrolyte. If the repairs involve prolonged exposure of the negative plates the separators should be taken out of the unit and kept saturated. Then allow the negative element to dry out in a free circulation of air. In this way, although the negative plates will discharge they will not heat up enough to cause damage.

We would like you to know the Gould men who will take care of your industrial storage battery requirements.

The West Coast states are served by a group of men working under the direction of Mr. R. P. Anderson, Sales and Service Manager at 2678 Lacy Street, Los Angeles. At San Francisco, Mr. J. H. Hamilton is located in the Flood Building. Mr. F. J. Smith is at 1233 N.W. Lovejoy St., Portland, and Mr. N. R. Farsje headquarters at W. 508-29th St., Spokane, Wash.

You may have a Production Bottleneck **HERE!**

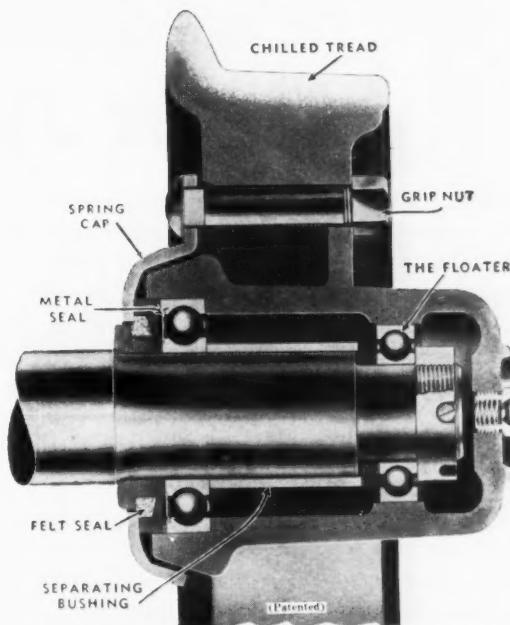


During these days hundreds of little leaks, little bottlenecks on the war production front, have been uncovered. Finding them and eliminating them, in many cases, has resulted in tremendous savings in time, material, money and manpower. Let's consider one of these leaks in mining.

In many mines, wheels and trucks have been an orphan child, so to speak. And, with so little attention given to their vital importance, they have become little bottlenecks to production—retarding output, wasting grease, labor and power.

If you are not using S-D "Floater" Ball Bearing Wheels, you may, unknowingly, have a production bottleneck. For, engineers' tests have proved that your locomotives can handle almost 50 per cent more load when the cars are equipped with S-D "Floater" than when equipped with wheels having other types of precision bearings. Furthermore, your own cost of greasing will be held to that of one greasing in 5 years, and wheel castings and bearings are guaranteed for 5 years against breakage, excessive wear or failure.

Don't wait any longer to check your wheels. They may be costing you plenty.



You can test S-D "Floater" for yourself on our FREE TRIAL PLAN. Write to us now.

Sanford-Day Iron Works, KNOXVILLE, TENNESSEE



This is Synthetic Rubber

Synthetic rubber is a new basic raw material which is processed, treated and formed in much the same way as natural rubber. And...like natural rubber...it is of different types, is capable of many variations.

Synthetic rubber is manufactured from gasoline, alcohol, coal and gases kept liquid under pressure and is now being made in five basic commercial types. Each type has distinct properties and characteristics that fit it for specific tasks. For some, synthetic rubber is superior to natural rubber. For others it is equally as good.

To determine which synthetic rubber is right for the job, however, requires a really thorough knowledge of rubber chemistry. The manufacturer must be familiar with the properties of all five commercial types

. . . Buna-S, Buna-N, Neoprene, Thiokol and Butyl.

United States Rubber Company uses all five basic types of synthetic rubber and is thoroughly familiar with the characteristics, properties and suitability of each type to the task for which it is intended. As the nation's largest user of synthetic rubber, "U.S." has built up a tremendous backlog of knowledge of this new basic raw material and experience in processing synthetic rubber to handle a certain definite job. Today, this knowledge and experience are being drawn upon to the fullest in supplying the Armed Forces and war industries with the synthetic rubber and synthetic rubber products they need.

A copy of "The Five Commercial Types of Synthetic Rubber" will be a valuable addition to your files.

Listen to the Philharmonic Symphony program over the CBS network Sunday afternoon, 3:00 p.m. Carl Van Doren and a guest star present an interlude of historical significance.



1230 Sixth Ave., Rockefeller Center, New York 20 • 4:30 E.W.T.

UNITED STATES RUBBER COMPANY

MEMO TO: R.L.B.
 you wanted all reports of
 lost time and tonnage
 called to your attention,
 Here's another one
 Larson
 Superintendent

TROUBLE REPORT

In No. 4 main outby, a haulage locomotive got away with full trip on 5 percent grade. It derailed at inby switch back. Main line tied up 8 hours—cost us 1000 man hours and 3000 tons of coal plus rebuilding locomotive. Cause—brakes did not apply due to lack of adjustment.

HOW TO LOCATE TROUBLE

Before it Happens

When accidents like the one above occur, alibis don't help. The time is lost, the damage is done.

But there is a way to prevent them. That's by locating possible sources of locomotive trouble—before it happens.

The Westinghouse Time-Saver Inspection Manual is designed to do just that. It contains the kind of practical inspection information your maintenance men need to do a thorough inspection job. It tells *when* and *where* to look for trouble—includes operating tips on how to prevent it.

Send for copies of this Inspection Manual today. It can go a long way to help you eliminate those costly trouble reports. Westinghouse Electric & Manufacturing Co., East Pittsburgh, Pa.

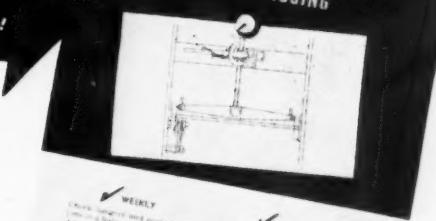
Westinghouse
 PLANTS IN 25 CITIES ... OFFICES EVERYWHERE
MINE LOCOMOTIVES



J-15083

PROPER INSPECTION
 COULD HAVE PREVENTED IT!

BRAKE RIGGING



✓ WEEKLY

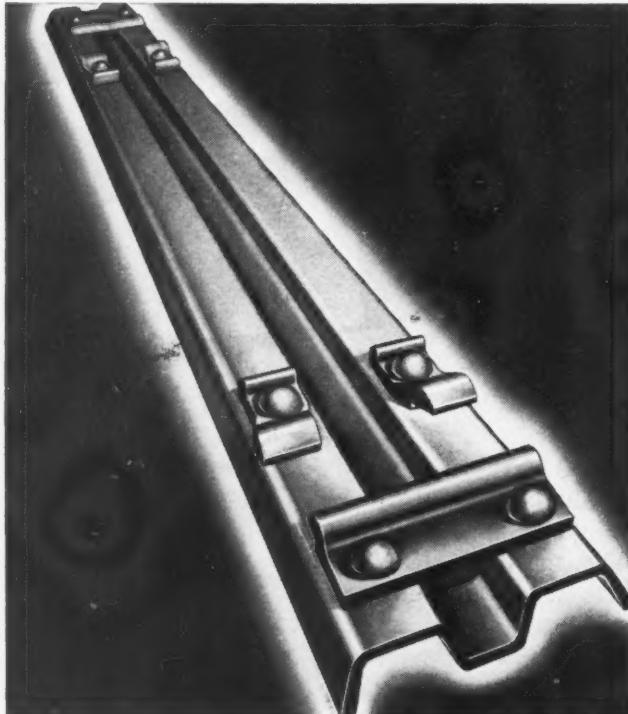
Check for loose bolts
 nuts and washers.

Check for broken or
 cracked parts.

Check for worn or
 broken parts.

to

MINE OPERATORS USING 40-LB. RAIL:



Now that you are using heavier rail sections to move tonnages out more efficiently, you need a bigger, sturdier steel tie.

Bethlehem manufactures such a steel tie. Specially designed for 40-lb. rail, the Bethlehem No. 5 Steel Tie weighs 5 lbs. per foot of section, has larger rivets, and bigger, more capable clips. Sturdier in every way, this new Bethlehem tie can be used and re-used in room after room with the heavier rails long after lighter ties would be pounded out of shape. Yet, considering its larger size, the No. 5 Tie costs less in the long run than a lighter steel tie.

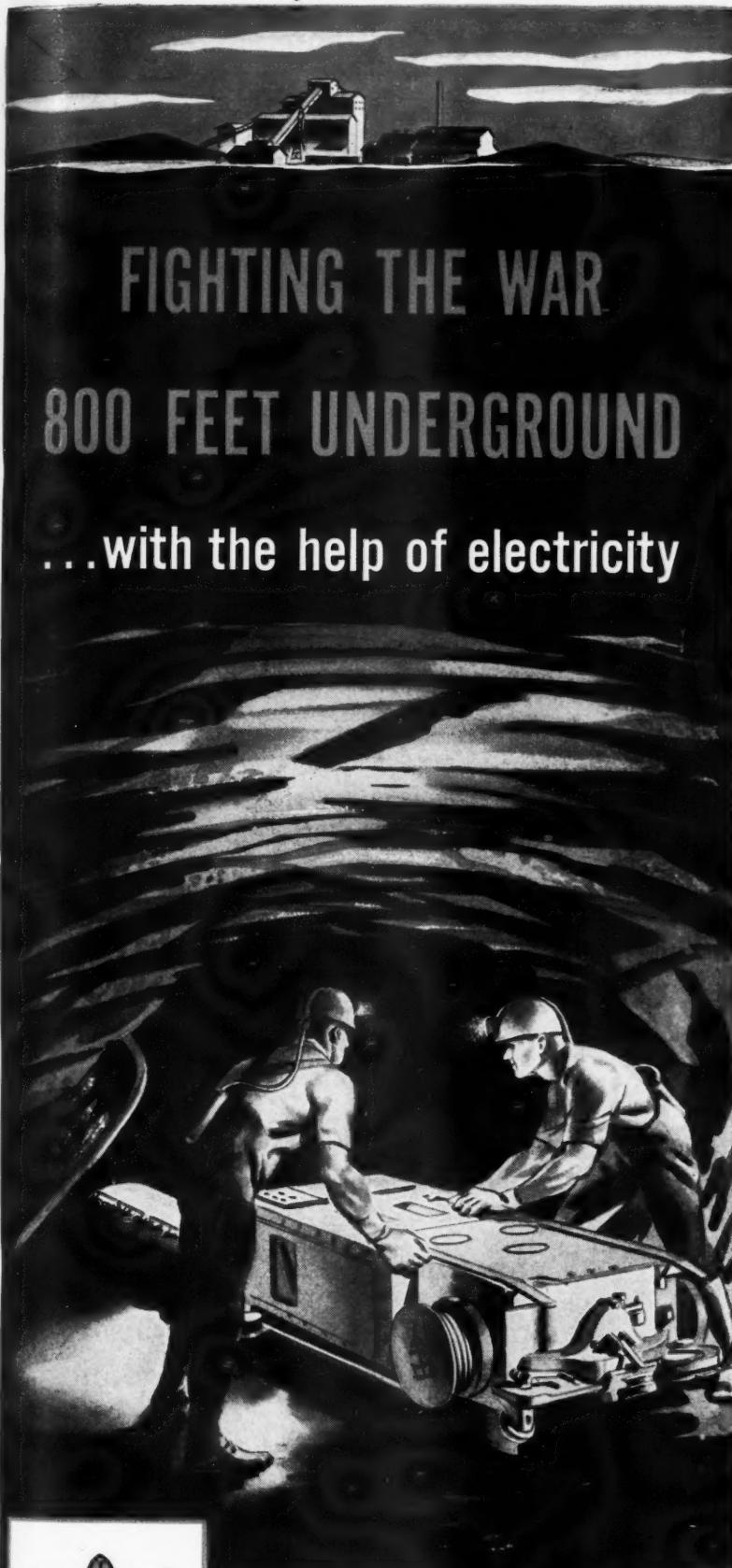
Write to Bethlehem Steel Company, Bethlehem, Pa., for folder 475, describing the new Bethlehem No. 5 Steel Tie.

Note the sturdy construction of this new No. 5 Steel Tie.

★ ★ ★



★ ★ ★



FIGHTING THE WAR 800 FEET UNDERGROUND

...with the help of electricity

In our nation's drive to victory, electrical power and the research-built Anaconda mining cables that carry it are helping vital mine production.

To keep mine production steady, operators use large quantities of electrical power . . . delivered through modern research-built wires and cables like Anaconda's tough, rubber-saving Duracord* and its all-rubber companion, Sunex Securityflex*.

Of particular interest today, with the conservation of rubber all-important, is Duracord. This construction was developed during the last war to meet the need for super-strength cords and cables. Its "fire hose" jacket, woven from long fiber cotton, makes Duracord tough on the outside—the weak spot in most cables.

The Duracord jacket makes possible rubber savings as high as 50% without sacrificing any efficiency. For further information, please write us immediately.

422B

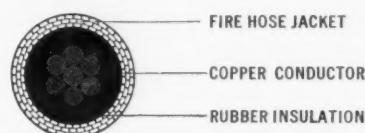
*Reg. U. S. Pat. Off.

ATTENTION!

Save Rubber with DURACORD without Loss of Efficiency

Here's a way you can effectively conserve rubber supplies and still get long-lived heavy duty electrical cords and cables . . . use Duracord.

This construction has served in some places for more than twenty years and it is still in use today. It is *not* a new construction.



ANACONDA WIRE & CABLE COMPANY

General Offices: 25 Broadway, New York City
Chicago Office: 20 North Wacker Drive
Subsidiary of Anaconda Copper Mining Company
Sales Offices in Principal Cities

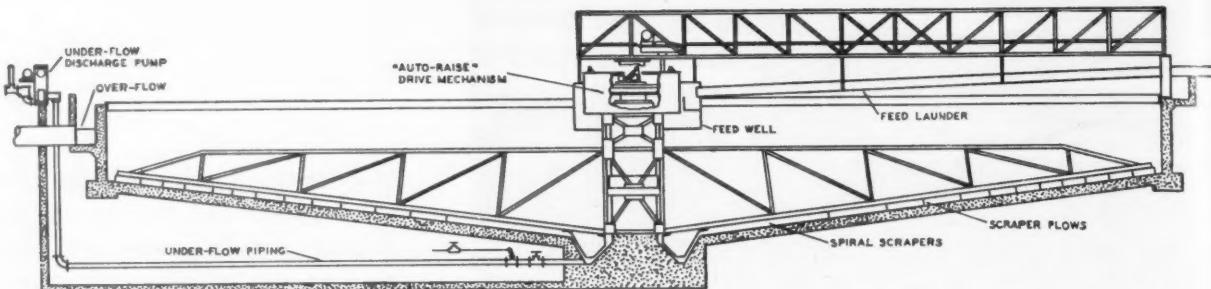


This familiar trade-mark
symbolizes the best ef-
forts of modern research
and production.



Sunex Securityflex and Duracord

ANACONDA WIRE & CABLE COMPANY



HARDINGE THICKENERS— CLARIFIERS FOR

**Treatment of Industrial Waste Waters
to prevent steam pollution or recover water**

HARDINGE EQUIPMENT

Bulletin No.

Agitators	31-C
Clarifiers	31-C
Classifiers, Air	17-B
Classifiers, Counter-Current	39-A
Classifiers, Hydro	31-C
Density Stabilizer	42
Dryers	16-C
"Electric Ear"	42
Feeders, Belt	33-C
Feeders, Constant Weight	33-C
Feeders, Disc	33-C
Feeders, Drum	33-C
Feeders, Non-Flooding	33-C
"Feedometers"	43
Filters, Sand	30-A
Metal Reclamation	8-A
Mills, Batch	19-A
Mills, Conical Ball	13-D
Mills, Conical Pebble	13-D
Mills, Rod	25-B
Mills, Tube	18-A
Mixers, Slurry	31-C
Pumps, Diaphragm	32
"Ruggles-Coles" Dryers	16-C
Kilns and Coolers	16-C
Scrubbers, Conical	37
"Thermomill"	17-B
Thickeners	31-C

One installation of a 60 ft. dia. Hardinge Thickener at an industrial plant to treat the plant waste water, formerly a source of stream pollution, delivers 800 gals. per minute of clarified water to the plant's clear water reservoir. The solids in the Thickener feed are settled, thickened and delivered as a slurry to an impounding basin.

Complete information on this and similar installations upon request.

Bulletin 31-C

HARDINGE

COMPANY, INCORPORATED — YORK, PENNSYLVANIA

New York, 122 East 42nd Street Chicago, 205 West Wacker Drive San Francisco, 501 Howard Street Toronto, 200 Bay Street



PRICE tells something of quality in wire rope... but performance tells more! Performance comes from what is put into the rope, and who put it in. The maker means more than the material, price, specifications... In years of hard jobs the world over, in records of cost and safety, in war service on land and sea and in the air... Rochester ropes have made Rochester a good name in wire rope... Today, all our output goes to government and high priority industries. Tomorrow, when you can get all the wire rope you want, remember Rochester when you want the best!

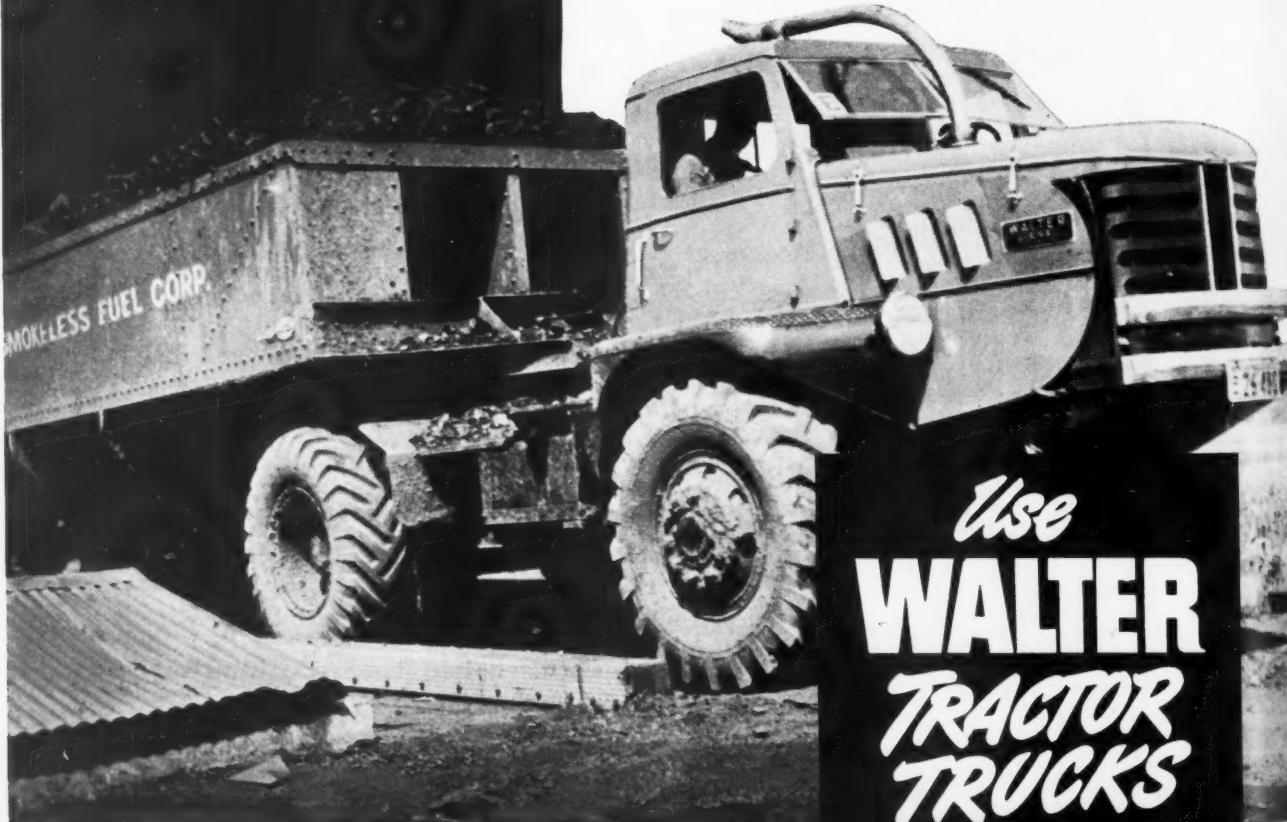


ROCHESTER *Ropes*
JAMAICA, NEW YORK • CULPEPER, VIRGINIA

E
ANIA
Street

STRIP WHERE YOU WANT— **WALTER** **TRACTOR** **TRUCKS**

**WILL GET THE
COAL OUT! . . .**

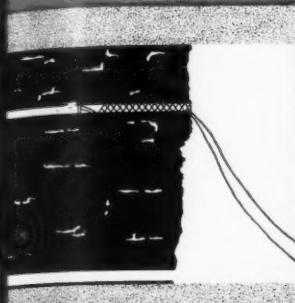


Use
WALTER
TRACTOR
TRUCKS

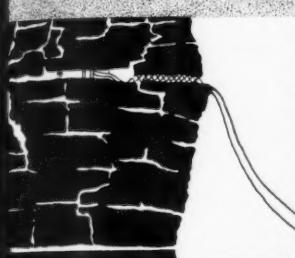
WALTER MOTOR TRUCK CO. • 1001-19 IRVING AVE., RIDGEWOOD, QUEENS, L. I., N. Y.

CARDOX

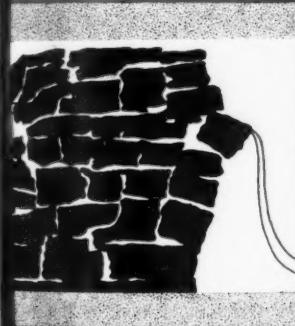
"THE NON-EXPLOSIVE MINING METHOD"



CARDOX non-explosive mining involves no radically new procedure. The seam is first undercut in the usual manner. Then holes are drilled and tubes inserted as shown at left.



CARDOX breaks down coal by a slow but steady push by carbon dioxide. This produces a combined heaving, spreading and shearing action.

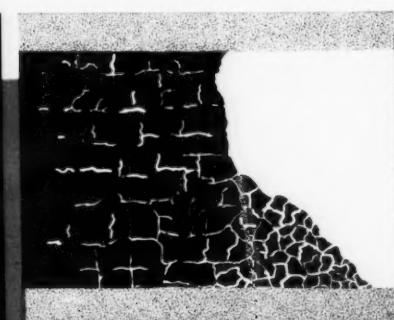


This illustration shows how the slow heaving action of the expanding carbon dioxide rolls the coal forward.



A typical fall of coal dislodged by CARDOX. Note how it has been rolled well away from the face for efficient handling by a mechanical loader.

Explosives are converted into gases in a violent chemical reaction and deliver a sharp, quick hammer-like blow.



The quick, shattering action of explosives frequently sets down and jams the face in the manner shown at left... greatly reducing loadability.

ROLLS OUT THE FALL FOR *Fast-Easy* LOADING...

• Wartime labor shortage multiplies the importance of the distinctive action of CARDOX in breaking down coal. Just as expanding steam in a steam cylinder produces a slow, steady push on the piston, expanding carbon dioxide from a CARDOX tube maintains a slow but steady push on the coal... rolling it away from the working face for fast, easy handling by mechanical loaders.

This extra forward roll of CARDOX-mined coal also permits the use of longer cutter bars... provides 16% to 50% more coal per face for the loader... saves 16% to 50% of the non-productive time spent each day in moving the loading machine.

The fact that CARDOX produces no smoke or noxious fumes permits further important time-savings... plus better utilization of available manpower and equipment. The crew can enter the working face immediately after the fall.

Wire or write for a free test demonstration of CARDOX at your mine.



CARDOX CORPORATION BELL BUILDING, CHICAGO

if you plan to use

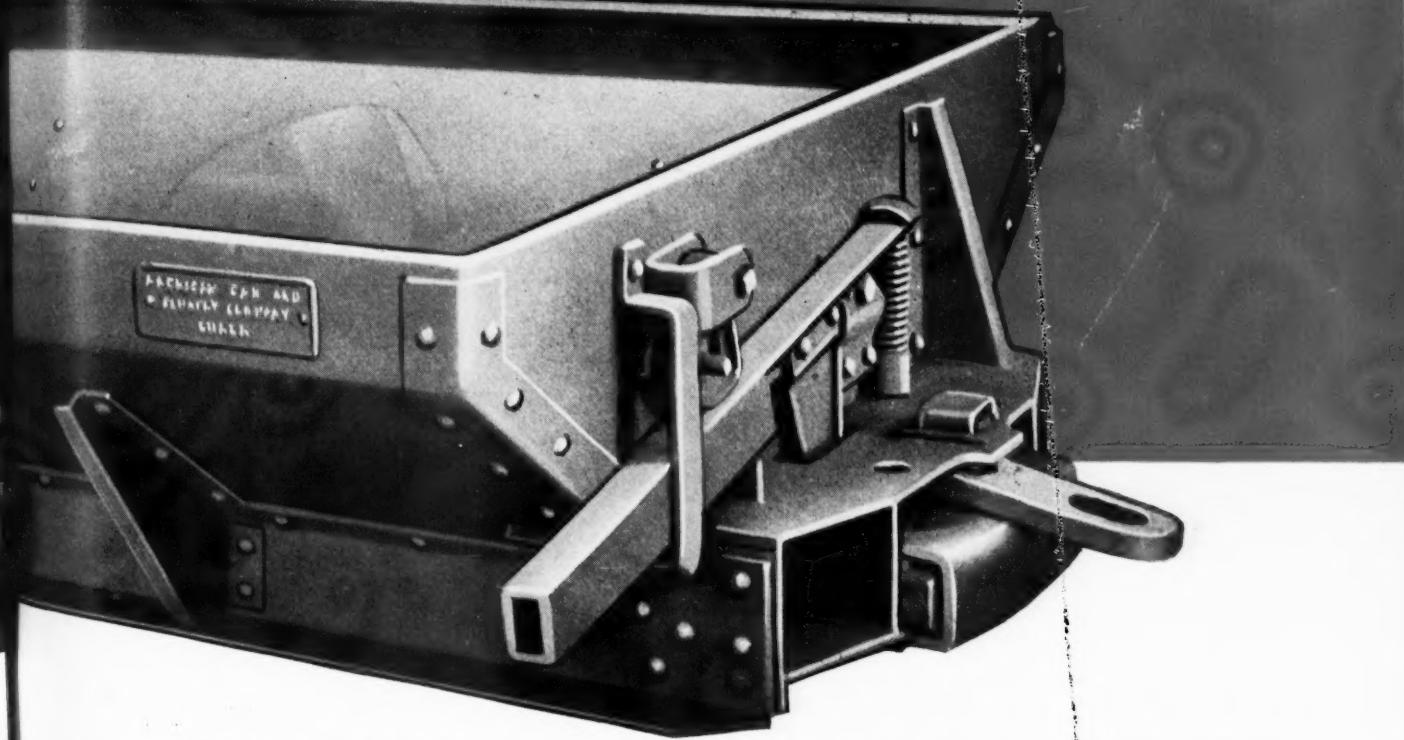


A.C.F. Chilled Tread Mine Car
Wheels, as manufactured under
our heat-treating process, are made
from a special mixture of metals—
better for mine car wheels than
steel or iron, alone.

HERE'S THE A.C.F. CAR
THAT HAS
EVERYTHING!

a.c.f.

AMERICAN CAR AND FOUNDRY COMPANY DROP BOTTOM CARS



The great tonnage called for from our coal mines today, demands the best of equipment for its speedy production. Shown above is an **A.C.F.** automatic drop-bottom mine car of the most advanced design. Note carefully its many outstanding quality features.

Through axles are used, and the wheels are mounted on modern anti-friction bearings designed for this class of service. The highly successful and favorably known **A.C.F.** electrically welded end-sill construction with built-in spring bumper assures maximum

strength and endurance. The drop-bottom doors are equipped with the **A.C.F.** simplified operating and locking mechanism. All moving parts, including wheels, bearings and door control mechanism, are *fully* accessible.

In addition to drop-bottom mine cars, **A.C.F.** supplies mine cars of every other type, specifically built to meet your own operating conditions. Also, any needed new wheels, trucks, axles, bumpers, and electrically welded end-sill construction with built-in spring bumpers, to rehabilitate your present cars.

AMERICAN CAR AND FOUNDRY COMPANY

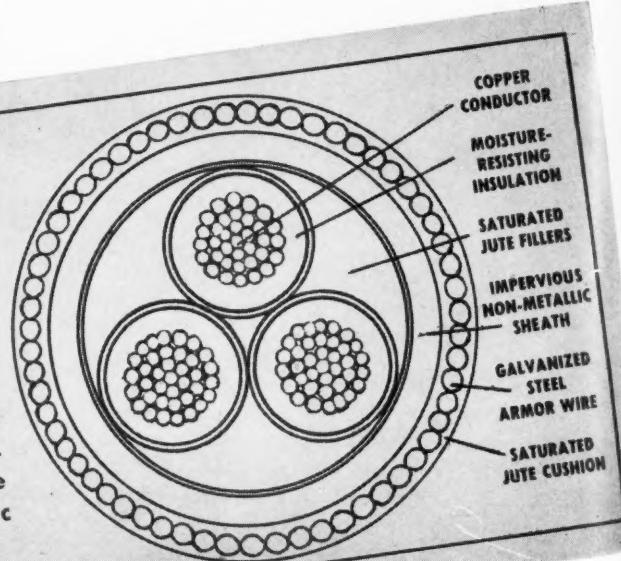
NEW YORK • ST. LOUIS • CHICAGO • PHILADELPHIA • BERWICK, PA. • PITTSBURGH • CLEVELAND • HUNTINGTON, W. VA.



Mining Cables must be CUSTOM BUILT



• Hazard mine power cables for shafts and boreholes are lighter and less costly than lead-sheathed and power cables. They are much easier to handle and more readily connected. One notable departure from old designs is the substitution of an impervious non-metallic jacket for the lead sheath.



Electrical cables for mining use must be designed for the job—they must be able to stand abuse, to resist moisture, to provide protection from mine acids. And certain mines may have unusual conditions that require entirely new solutions in cable design.

Okonite's Hazard Insulated Wire Works Division was fostered and nurtured in the heart of the Anthracite Coal Region. It is only natural therefore that much of its development and production should be connected with mining. Hazard engineers constantly

study mining conditions right on the job and have developed a number of custom-built types, designed especially for the mining industry.

This intimate contact is a unique advantage and, as a result, Hazard electrical cables are known throughout the mining industry. If you are contemplating electrification or are already using electric power, Hazard engineers will be glad to consult with you regarding the types of cable that will assure maximum safety and reliability.

HAZARD INSULATED WIRE WORKS
DIVISION OF THE OKONITE COMPANY

Works: Wilkes-Barre, Pa. • Offices in Principal Cities



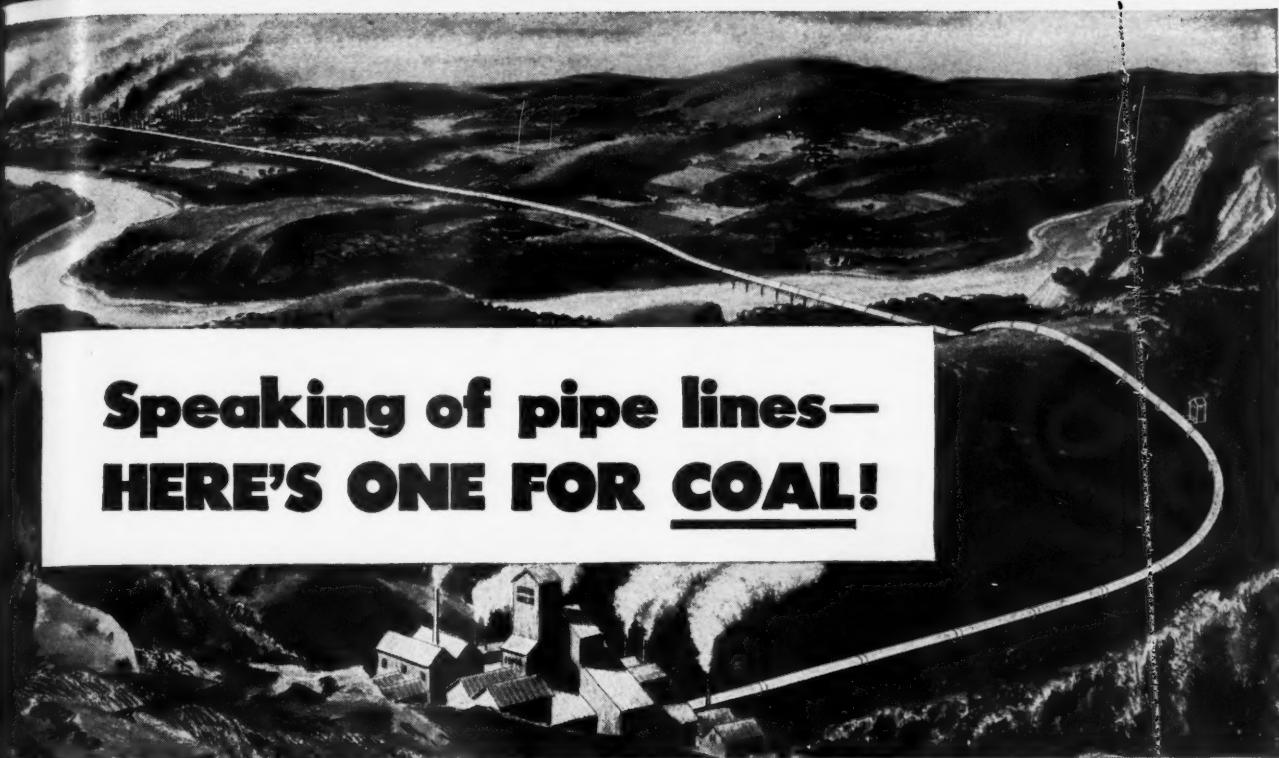
3210

HAZARD



Insulated Wires and
Cables for Every Mining Use

BUY U.S. WAR BONDS—Every Payday All Hazard Employees BUY U.S. WAR BONDS



Speaking of pipe lines— HERE'S ONE FOR COAL!

A new era is here in bulk transportation

IMAGINE pumping coal direct from mine to market, just as fuel oil is piped from wells to distant cities and at comparable low cost! That may sound like a mine operator's dream of the millennium, but it is another of the new developments in bulk transportation perfected by the G.T.M.—Goodyear Technical Man—for postwar industry.

The coal "pipe line" is designed to transport bituminous coal to large industrial areas in trainload quantity, daily. It is made of rubber—a super-tough, multiple-ply, wire-reinforced rubber hose, called Diversipipe, first produced by Goodyear for carrying sand, gravel, mine tailings, slag and other materials too abrasive to be handled in metal pipe.

How does it operate? First, coal is crushed at the mine to eliminate lumps. Then it is suspended or "floated" in water and run into the Diversipipe line. The mixture is not as viscous as fuel oil; it flows down-grade by gravity, is carried up-grade by booster pumps. At destination the washed coal is sieved off into hoppers.

Continuous haulage

How about cost? Experimental surveys for Diversipipe lines from 50 to 75 miles long indicate coal can be transported at consid-

erably lower cost per ton, including installation expense, than by intermittent methods. Such installations must wait until rubber is again abundant, but any coal operator can figure the advantage in winning postwar markets, where such an installation is feasible.

Today the rubber "know-how" that produced abrasion-resistant Diversipipe is building extra wear into war-grade belts, hose and other in-

Outline shows how a Goodyear Diversipipe coal line can be installed to follow ground contour. Several mines could use the same line.

dustrial goods, made from both natural rubber and synthetics. Whether you are planning now for the future, or need dependable rubber for war production, consult the G.T.M. Write Goodyear, Akron, Ohio or Los Angeles, California, or contact the nearest Goodyear Industrial Rubber Goods distributor.

MAKE YOUR RUBBER LAST — send for free manual
"GOODYEAR INDUSTRIAL RUBBER PRODUCTS CONSERVATION."



and have
designed
ge and, as
through-
emplating
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with you
are maxi-

WORKS
ipal Cities

and
Use

COAL AGE

COAL AGE • September, 1943

*SPECIFIC

TIDEWATER

LUBRICANIA

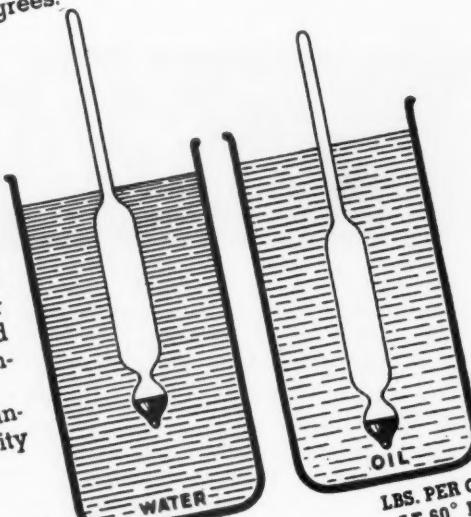
DEFINITION: The gravity or density of a liquid is a numerical value which enables the determination of the weight of a known volume of the product.

GRAVITY A.P.I. The gravity of petroleum products in the United States is generally obtained by means of a hydrometer graduated on the A.P.I. (American Petroleum Institute) scale. It is reported as Gravity in degrees A.P.I. Unless otherwise stated, it applies when the product is at a temperature of 60° F. If taken at a higher or lower temperature a correction is applied to reduce the reading to the standard 60° F. temperature.

The A.P.I. Gravity bears a definite relationship to specific gravity according to the formula:

$$\text{Sp. Gr.} = \frac{141.5}{131.5 + \text{A.P.I. degrees}}$$

The A.P.I. scale differs from the Baumé scale (used for non-petroleum liquids lighter than water) by only one-tenth to seven-tenths degrees.



LBS. PER GL.
AT 60° F.

10°	1.00	8.33
36-40°	0.84-0.82	7.03-6.87
24-30°	0.91-0.88	7.58-7.30
18-22°	0.95-0.92	7.88-7.68

EXAMPLES:

Water (distilled)

Kerosene

Machine Oil (paraffinic)

Machine Oil (naphthenic)

SIGNIFICANCE: Gravity is of little significance to the user. The quality or suitability of a lubricant is more readily appraised by other tests.

DRUMS! DRUMS! DRUMS!

War needs make it extremely important that all empty drums be returned immediately.



TYCOL lubricants are made from the most suitable materials and carefully refined to meet the most stringent laboratory specifications and service requirements. Scientific manufacture from the finest available material assures unvarying high quality in all Tycol lubricants.

TIDE WATER ASSOCIATED OIL COMPANY

Eastern Division: 17 Battery Place, New York 4, N. Y.
Principal Branch Offices: Boston, Philadelphia, Pittsburgh, Charlotte, N. C.

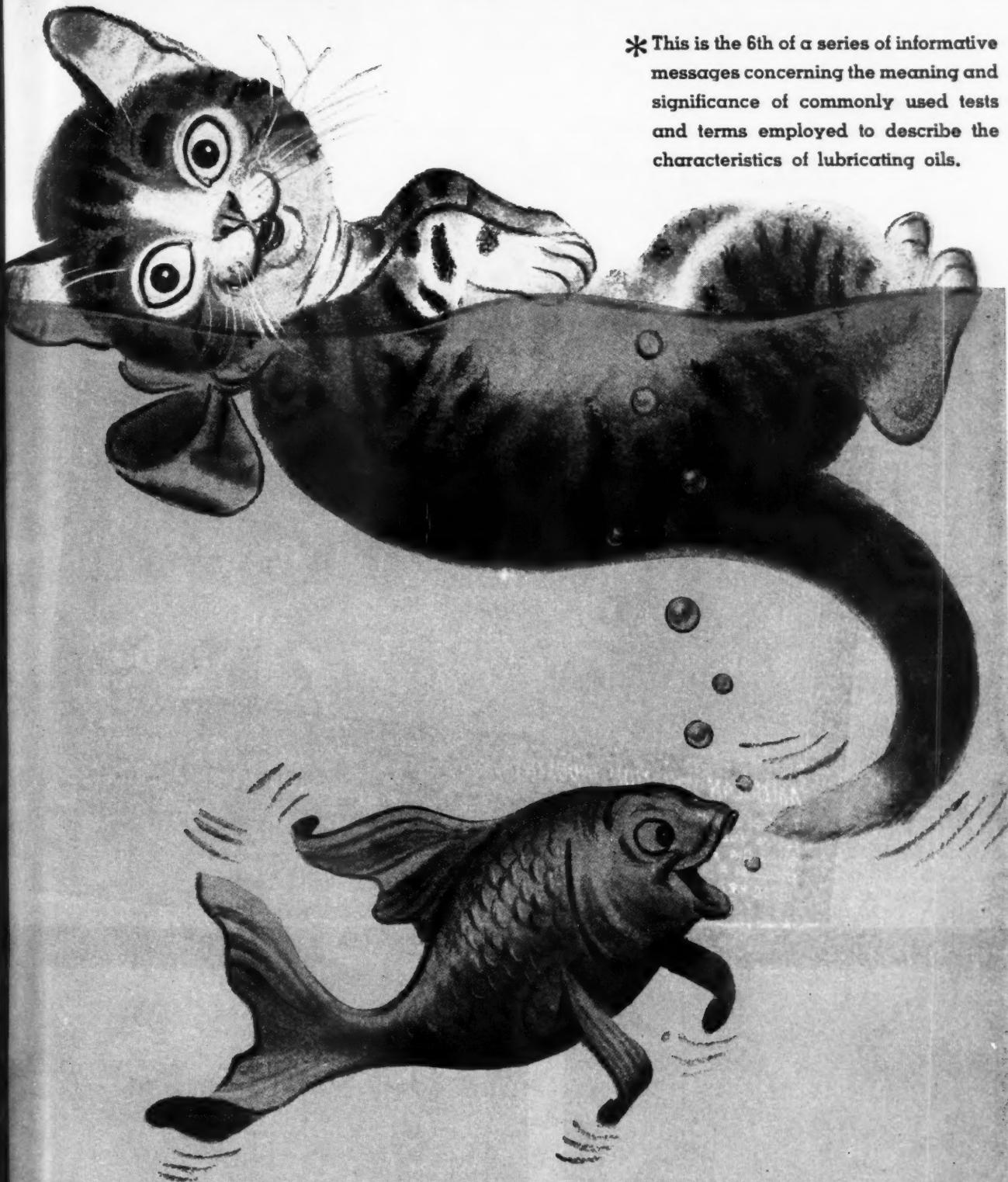
MAKERS OF THE FAMOUS VEEDOL MOTOR OIL

SCIENTIFICALLY ENGINEERED
FOR EVERY INDUSTRIAL USE

TYCOL

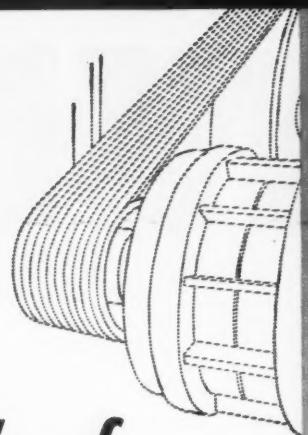
GRAVITY

* This is the 6th of a series of informative messages concerning the meaning and significance of commonly used tests and terms employed to describe the characteristics of lubricating oils.



INDUSTRIAL LUBRICANTS

Thousands of



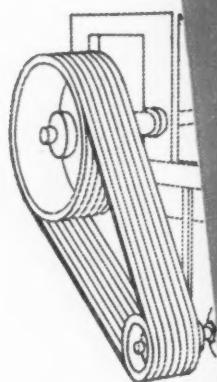
92%

GATES
VULCO ROPES

BOULDER DAM

Back in 1935 when Boulder Dam was still the biggest thing mankind had ever built, Gates Vulco Ropes were already first choice of America's leading Engineers. More than 92% of all V-belts used in building Boulder Dam were Gates Vulco Ropes.

GATES VULCO ROPES...



63%

GATES
VULCO ROPES

AMERICAN AVIATION INDUSTRY

In 6 of America's largest aircraft-producing units, 63% of all the belts now driving machines are Gates Vulco Ropes. Where belts are subjected to severe heat and oil conditions, Gates has supplied the aviation industry with thousands of special heat and oil resisting belts. These belts, made of a special synthetic rubber, withstand severe heat and oil conditions twice to three times as long as V-belts made with natural rubber.



87%

GATES
VULCO ROPES

PENNSYLVANIA TURNPIKE

Built by 155 contractors from 18 different States—yet more than 87% of all the V-belts used were Gates Vulco Ropes.



94%

GATES
VULCO ROPES

GREAT CENTRAL VALLEY—California

In many ways the greatest project of all—and, here again, 94% of the V-belts selected were Gates Vulco Ropes.



76%
GATES
VULCO ROPES

GRAND COULEE

Gates began supplying industry with V-belts made entirely of synthetic rubber in 1938—just when the first big units of Grand Coulee were nearing completion. On this mammoth engineering project, Gates Vulco Ropes totaled more than 76% of all the V-belts used.



85%
GATES
VULCO ROPES

COLORADO RIVER AQUEDUCT

American Engineers once more gave Gates Vulco Ropes predominantly first place. To build 91 miles of tunnels, 60 miles of canals, 56 miles of conduit, 3 immense aggregate plants and a diversion dam 320 feet high, 85% of the V-belts chosen for the work were Gates Vulco Ropes.

ES----in America's Greatest Industrial Projects— Have Been Made Entirely of **Synthetic Rubber**

It is no accident that GATES—the World's Largest Maker of V-belts—began supplying industry with thousands of V-belts made entirely of synthetic rubber 5 years before anyone could know that supplies of natural rubber would be cut off by war.

The Gates synthetic rubber V-belt—now thoroughly tested by years, not months, of service—was in no sense developed as merely a "substitute" for rubber. It was designed to be—and in certain important applications it has proved itself to be—greatly superior to belts of natural rubber.

There is this to be kept always in mind concerning rubber:—A tree can make only one kind. In synthetic rubbers we have the choice of many kinds. Gates uses each kind where it best meets some particular service need.

In the Gates Special Heat and Oil Belt, for instance, a very special kind of synthetic rubber is used. This special synthetic rubber has the ability to withstand heat and oil

much better than natural rubber can.

You know, of course, from every day experience, that your Standard Gates Vulco Ropes withstand exposure to heat and oil very well. It is when the heat or oil conditions become excessively severe that the Gates special synthetic V-belt, at a little higher price, has proved its ability to give very much longer wear than any other V-belt you can use.

Beyond any question, Gates has had longer experience and more successful experience in the fabrication of synthetic rubber V-belts than any other manufacturer.

To know of this will be to your advantage—particularly NOW when Gates' unequaled experience in making synthetic rubber V-belts can be put to use right in your own plant. You have only to look in your telephone directory and call the Gates Field Engineer. He will put at your service the full benefits of Gates' knowledge and experience without the slightest obligation.

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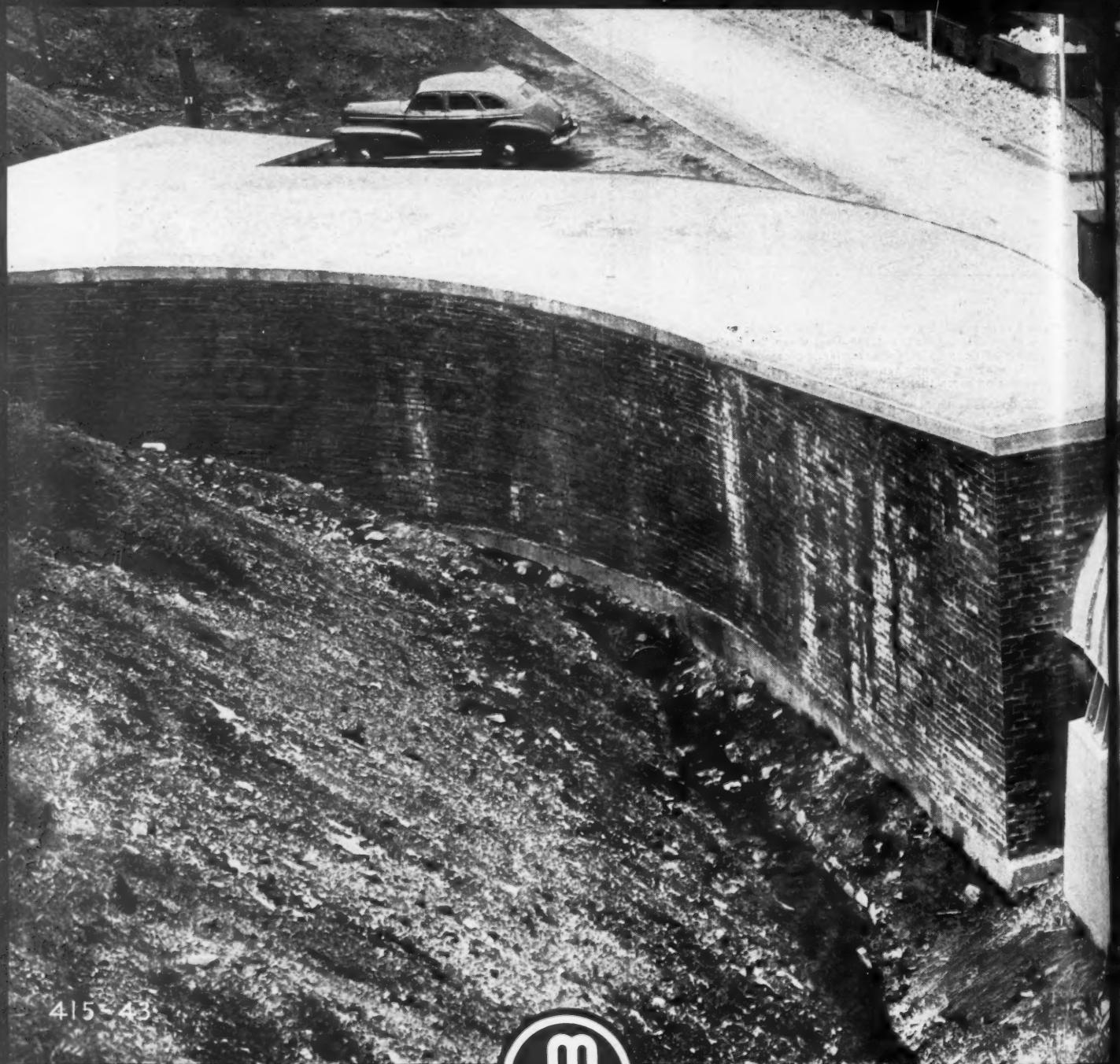
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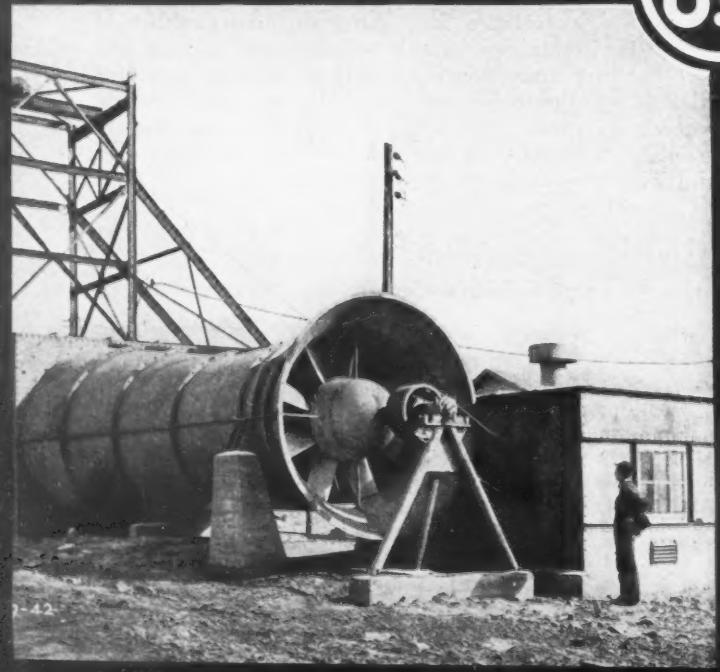
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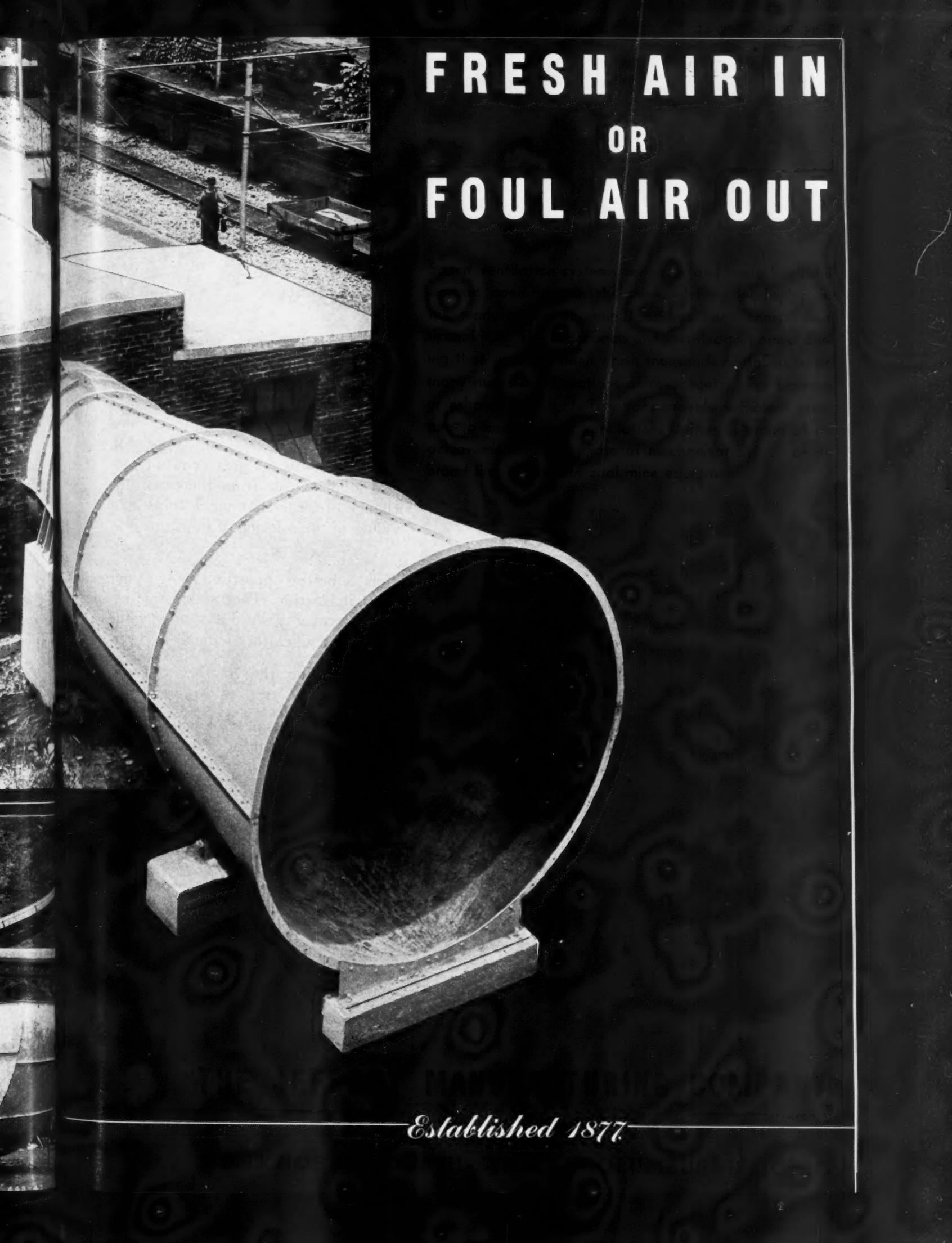
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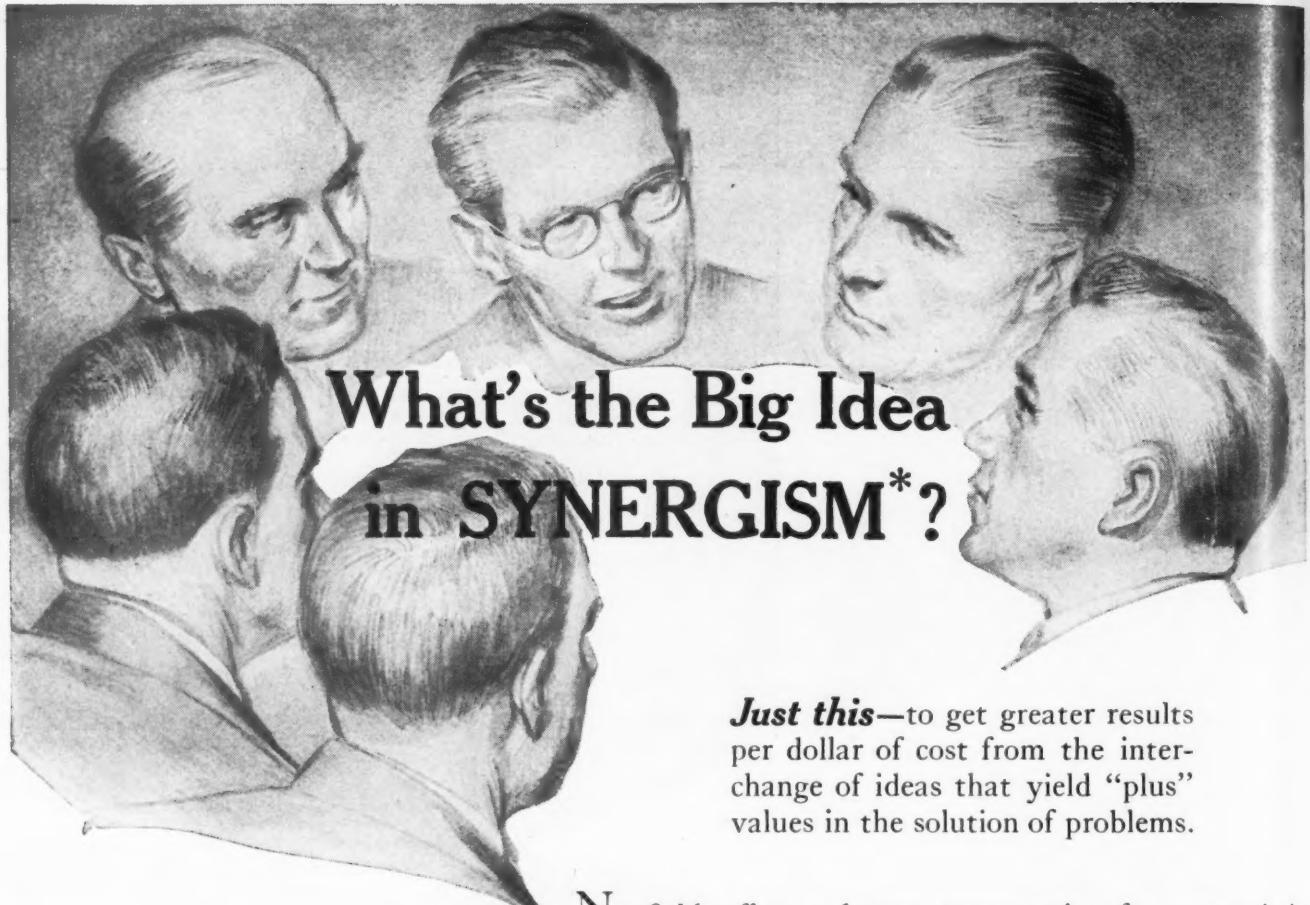
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What's the Big Idea in SYNERGISM*?

Just this—to get greater results per dollar of cost from the interchange of ideas that yield "plus" values in the solution of problems.

No field offers a better opportunity for synergistic thinking than coal blasting. The interchange of ideas in overcoming problems can uncover a world of "plus" values . . . new and better methods and devices, greater production, lower costs.

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Atlas permissible explosives in sprayed shells offer big advantages. The cartridges of sprayed shell permisibles are not redipped in paraffin, and smoke and fumes are kept at a minimum. Thus, faster return to the face is possible.

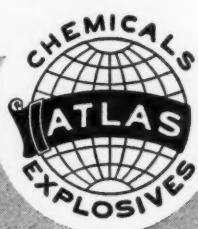
Most Atlas permisibles now are available with sprayed shells. Their range of effectiveness is limited only by the synergistic thinking applied to them.

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Never install a new wire rope on a worn sheave—to do so invites early failure. When the groove gets too wide, it permits the rope to flatten. . . . And don't try to run a new rope over a groove that is too narrow. That pinches the life out of it.

Before installing a wire rope (even the longer-wearing, easier-handling **Hazard LAY-SET Preformed**) carefully check the condition of your sheaves, using the standard sheave groove gauge. For calculating safe groove diameters, the following table gives the exact extent by which the groove diameter should exceed the diameter of the rope:

For ropes of the following diameters in inches	Groove diameter should be greater than rope by not less than the following fraction of an inch	Groove diameter should be greater than rope by not more than the following fraction of an inch
1/4 to 5/16	1/64	1/32
3/8 to 3/4	1/32	1/16
13/16 to 1-1/8	3/64	3/32
1-3/16 to 1-1/2	1/16	1/8
1-9/16 to 2-1/4	3/32	3/16
2-5/16 and larger	1/8	1/4
•	•	•

Save critical steel by careful inspection and proper maintenance of *all* equipment and by using **Hazard LAY-SET Preformed** —the greater dollar value rope. All Hazard ropes made of Improved Plow Steel are identified by the Green Strand.

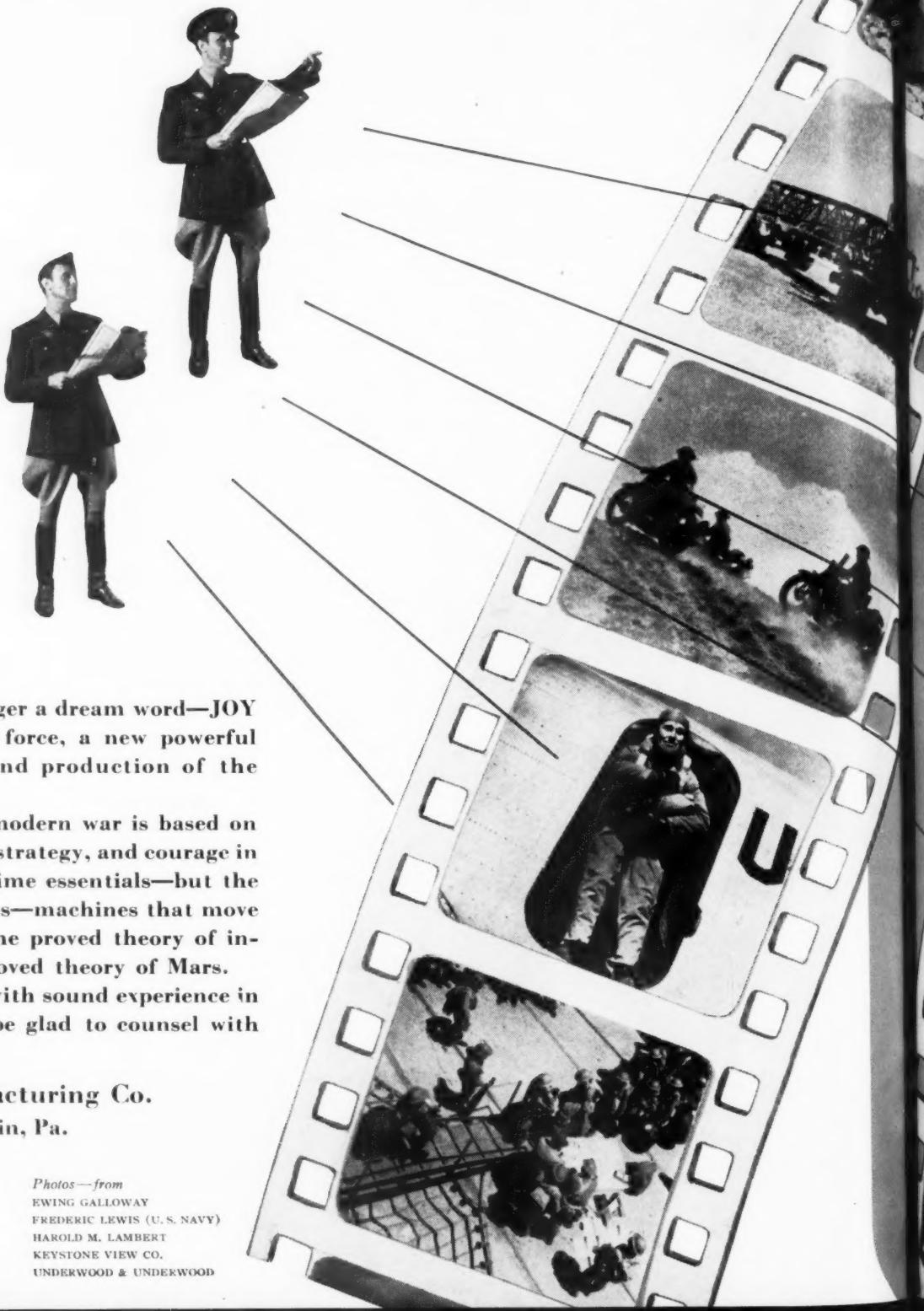
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HAZARD LAY-SET *Preformed* WIRE ROPE

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Mechanization is no longer a dream word—JOY made it into a mighty force, a new powerful force, in the mining and production of the nation's coal—

The whole theory of modern war is based on mechanization—skill in strategy, and courage in battle are, of course, prime essentials—but the tools of war are machines—machines that move and kill and destroy. The proved theory of industry—becomes the proved theory of Mars.

JOY Engineers, men with sound experience in the coal industry, will be glad to counsel with you.

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YOU and your fighting brothers of Yugoslavia made terms with the Axis . . . your terms . . . Unconditional Defiance. And from mountain strongholds, your battalions continue to fight back on those terms.

Your active patriotism is inspiring—and, in answer, we and our allies are drawing closer. Our bombs are beating down on our common enemy. Our armies are advancing by land, sea and air to break through and join you in Victory.

The road that leads to freedom has its beginning deep in the earth—in mines, in pits and quarries. Basic war material—blasted loose by mining men and started on its way to the war front—arrives there as fighting machines. And to make this basic material available to manufacture, our Company provides the miners with dependable, useful products—Ensign-Bickford Safety Fuse and Primacord-Bickford Detonating Fuse. With mining men and fighting men, we share the will toward Victory—and *Victory Begins Underground!*

THE ENSIGN-BICKFORD COMPANY
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COAL AGE

DEVOTED TO THE OPERATING, TECHNICAL AND BUSINESS PROBLEMS OF THE COAL-MINING INDUSTRY

SEPTEMBER 1943

THE TIME IS NOW

BLOOD AND GUTS alone are not enough to win a modern war. It takes material, more material and still more material. That is where the home front comes in. Production, more production and still more production is the key to speedy victory with the least expenditure of lives and treasure.

The tide of victory is beginning to flow for the United States and its allies. But the big battles, the final assaults, are in the future. In fact, we are just starting. But we are at the point where a little increase in pressure, a little greater superiority in matériel, will make a big difference in the speed with which victory is achieved.

Coal mining, along with other industries and the people of the United States, entered the conflict with the firm resolve to win conclusively—as soon as possible. That resolve still guides the nation in spite of growing difficulties, of which coal has had its share. A few preliminary victories should not be allowed to weaken it by creating a feeling that it is all over but the formalities. It is a long way from over. The time to put on the pressure, in fact, just arrived. Now, more than ever, management and men must pour on the coal for victory.

TRIAL BALLOON?

THE RETURN of over 100 mines in August, while seemingly a good augury for the future, in fact did little to cut through the fog hiding the course of government mine operation. Balanced as it was by strengthening of the government operating organization, the step leads to speculation as to whether it really was only a trial balloon, especially since no progress was made in resolving the real difficulty—John L. Lewis' stabilization-busting campaign.

With Lewis showing no signs of modifying his stop-work order, the stage still was set for a hectic time in coal. One possibility was a series of seizures and returns—an extreme bordering on the ridiculous. Or, under the "productive-efficiency" provision or other guise, the government might elect to hold onto the properties indefinitely. The reaction to the August return, it is reasonable to assume, will tell the tale.

If the reaction should be further work stoppages on a

major scale, their roots still would lie in a government labor policy—or lack of policy—which permits the growth and continued existence of conditions such as those now prevailing in coal mining. True, Lewis twice exposed himself to the War Labor Board. True, also, that a new executive order purports to strengthen WLB's hand in dealing with recalcitrant labor leaders. But aside from perpetuating the theory of the armed services as penal institutions, the sanctions, such as placing union dues in escrow, prove, upon examination, to be no sanctions at all against a union with a healthy treasury. The real issue still remains a sound and workable labor policy.

NEED AND PROOF

THE NEED for a strong public relations program for coal mining (see the following pages in this issue), as well as proof of what it can accomplish, have been strikingly illustrated by two recent events. One was Harold L. Ickes' article in the Sept. 4 issue of *Collier's*. Mr. Ickes' stated objective was presenting the "facts," presumably to facilitate settlement. But what came out? The public got a dark picture of the future coal supply—perhaps needlessly dark. John L. Lewis was mildly chided for his part in production interruptions. And in contrast, by such statements as: the miners have just grievances, the majority of the operators had no intention of reaching an agreement, the operators broke off negotiations, and others in a similar vein, the definite impression was left that the whole coal imbroglio arose through the machinations of the operators and for no other reason—an impression hardly in accord with the facts.

On the credit side, Bituminous Coal, Inc., now Bituminous Coal Institute, made Eleanor Roosevelt's column Aug. 28 with earnings figures more representative than some she had previously circulated—evidence that coal can get the facts before the public if it will make the attempt. That is the aim of good public relations, and since it is the best guarantee of public confidence and respect, meanings dollars and cents to every man in coal mining, the industry's program deserves no less than unanimous support.

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COAL AGE

Public Relations

Dollars and cents to every man in coal mining. That is the essence of public confidence in the industry and its product.

Coal's No. 1 job is winning the war. No. 2 is its public relations. In the pages which follow, Coal Age analyzes the problem and its solution.

THE PROBLEM:

Public Misunderstanding

IF THE PRODUCT of an industry is its body, then its reputation is its soul. And unless it guards that reputation as jealousy as it does the quality of its product, the road to the paradise of profitable operation is likely to be much longer and rougher than the smooth, straight boulevard of public confidence and respect.

Coal mining, as a case in point, deserves more credit—much more—than the public, its customers, is inclined to give it. Coal is one of the mainstays of the war effort. It is a major support of the home front. It will do a business of about \$1,800,000,000 in 1943 on the basis of estimated average mine realization. It certainly is a well-advanced convalescent; if not in the ruddy bloom of health, yet it still is all too frequently dismissed with the tag of "sick industry."

This leads to the \$64 question: Is the public more likely to want to do business with an industry that it feels is on its way out or at best has only

an uncertain future—in short, a "sick industry"?

Is the public more likely to want to trade with an industry which it feels, rightly or wrongly, underpays its employees and prevents them from bettering their condition—with an in-

HOW TH P

THE QUESTIONS

MINERS' WAGE —	Better	Worse	Same
	7	12	10
WORKING CONDITIONS —	Better	Worse	Same
	2	20	6
LIVING CONDITIONS —	Better	Worse	Same
	2	18	7
TREATMENT BY EMPLOYERS —	Better	Worse	Same
	1	1	1
PRICE INCREASE FROM \$2 WAGE INCREASE —	No effect	10c. per ton	40c. per ton
			70c. per ton
			\$1.00 per ton
GOVERNMENT OPERATION: EFFECT ON PRICE —	Raised	Lowered	No Change
FUTURE COAL USE —	Increased	Decreased	No Change
COAL-COMPANY PROFITS —	Reasonable	Excessive	Inadequate

WHAT COAL AGE ASKED THE PUBLIC

- How do you think coal miners compare with workers in other industries from the standpoint of:
Wages (check one)? Better Worse Same
Working conditions (check one)?
Living conditions (check one)?
Treatment by employers (check one)?
 - What is your guess on how raising miners' wages \$2 a day would affect the retail price of coal? (check only one)
No effect? Raise it 10c a ton? 40c? 70c? \$1.00?
 - If the government operated the coal mines do you believe the price to the consumer in the long run would be: raised? lowered? stay the same?
 - Do you think the use of coal in the future will:
increase? decrease? stay the same?
 - Do you think coal mining companies' profits are:
reasonable? excessive? inadequate?
- Remarks:

Coal's No. 2 Job

WHAT THE PUBLIC REPORTED IN COAL AGE'S SURVEY

NUMBER OF REPLIES

NON-COAL-MINING AREAS — COAL-MINING AREAS —

	Maine	Conn.	Pa.	Va.	Ind.	Cent.	Coal-Mining Areas							
	Mass.	N. Y.	Md.-D. C.	N. C.	Ill.	and								
	N. H.	N. J.	W. Va.	Ga.	Mo.	W. Pa.	Md.	Ohio	Ind.	Ill.				
Better	7	35	7	22	14	1	3	14	2	12	4	1	8	6
Worse	12	128	35	5	45	40	7	27	10	15	8	1	9	21
Same	10	64	32	10	28	7	11	22	1	20	7	2	13	14
Better	2	7	1	6	7	1	3	6	—	5	—	1	5	7
Worse	20	179	66	16	62	43	15	48	9	23	13	1	19	25
Same	6	33	13	15	17	3	4	8	4	19	6	3	6	9
Better	2	10	3	3	6	1	—	6	—	1	—	—	5	5
Worse	18	179	62	16	67	42	15	45	7	23	13	2	17	23
Same	7	40	9	17	13	5	7	14	6	22	5	2	8	12
Better	6	91	5	11	13	2	1	7	3	12	2	—	6	7
Worse	10	84	12	4	29	22	3	24	3	5	8	—	11	10
Same	13	111	45	21	41	21	16	32	7	30	9	4	13	13
No effect	1	21	8	3	7	5	1	9	1	3	2	—	3	6
10c. per ton	6	55	25	7	21	5	4	19	5	2	5	2	12	11
40c. per ton	12	86	26	15	35	21	11	27	3	27	9	1	10	14
70c. per ton	4	22	4	7	10	10	2	2	3	12	2	1	3	2
\$1.00 per ton	4	32	10	5	9	4	1	4	1	1	1	—	2	4
Raised	14	134	48	22	39	33	17	38	7	30	9	2	14	25
Lowered	5	27	6	2	14	3	1	11	3	1	6	1	4	6
No Change	9	64	20	13	27	13	5	14	2	16	5	1	12	9
Increased	9	97	23	12	31	16	9	29	7	26	4	2	10	14
Decreased	13	77	35	14	37	18	6	19	1	10	8	—	11	20
No Change	5	52	15	9	16	12	6	15	5	11	7	2	9	6
Reasonable	17	111	44	26	46	23	7	36	7	31	6	2	17	21
Excessive	11	80	16	6	28	19	3	18	4	8	10	2	10	10
Inadequate	1	25	12	2	5	3	3	4	2	6	2	—	8	2

industry it thinks is not putting forth its best efforts to protect its workers from the natural hazards of employment—with an industry it believes is characterized by owners who are either smug fuddy-duddies or malefactors of great wealth?

All of the public does not believe all of these things and others about coal, but a substantial portion does and an even larger percentage places credence in some. The existence of these

beliefs presents coal mining with perhaps its greatest challenge—a challenge it is now preparing to meet on an industry-wide scale.

Meeting this challenge and capitalizing on the accompanying opportunity, while admittedly a major task, may not be quite as difficult as might be imagined, however. There is good ground for belief, as brought out in a Coal Age sampling of public opinion, that there is a latent tendency to favor

coal mining which needs only careful cultivation to bring it to full flower.

But this survey also brought out some widespread impressions which, though erroneous, will need some heavy digging to uproot. The public's opinion was sought on eight points of major moment to coal mining: workers' wages, working conditions, living conditions and relations with employers; effects of wage increases on prices; effects of government mine

operation on prices; the future course of coal use; and the profit picture of the industry.

The survey, as stated, was a sampling operation. The area covered was the Middle West, the eastern and northeastern States, part of the South Atlantic States and scattered communities on the borders. In this area, practically all of the anthracite and a large percentage of the bituminous tonnage is consumed. Most of the individuals addressed resided in consuming areas, but residents of coal-mining towns also were questioned. As might be expected, the latter, with

a better opportunity to become informed, were a little more inclined to favor coal than residents in non-coal-mining areas, although they still went along with them on some points.

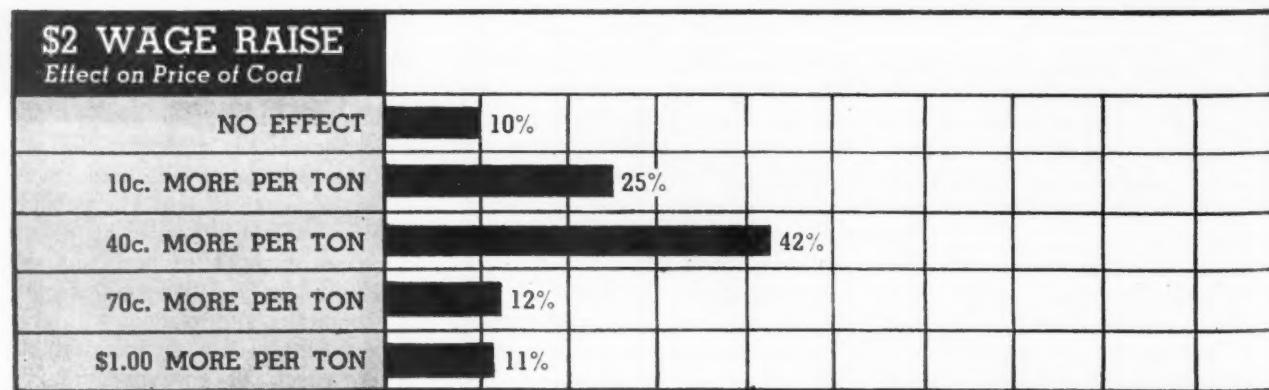
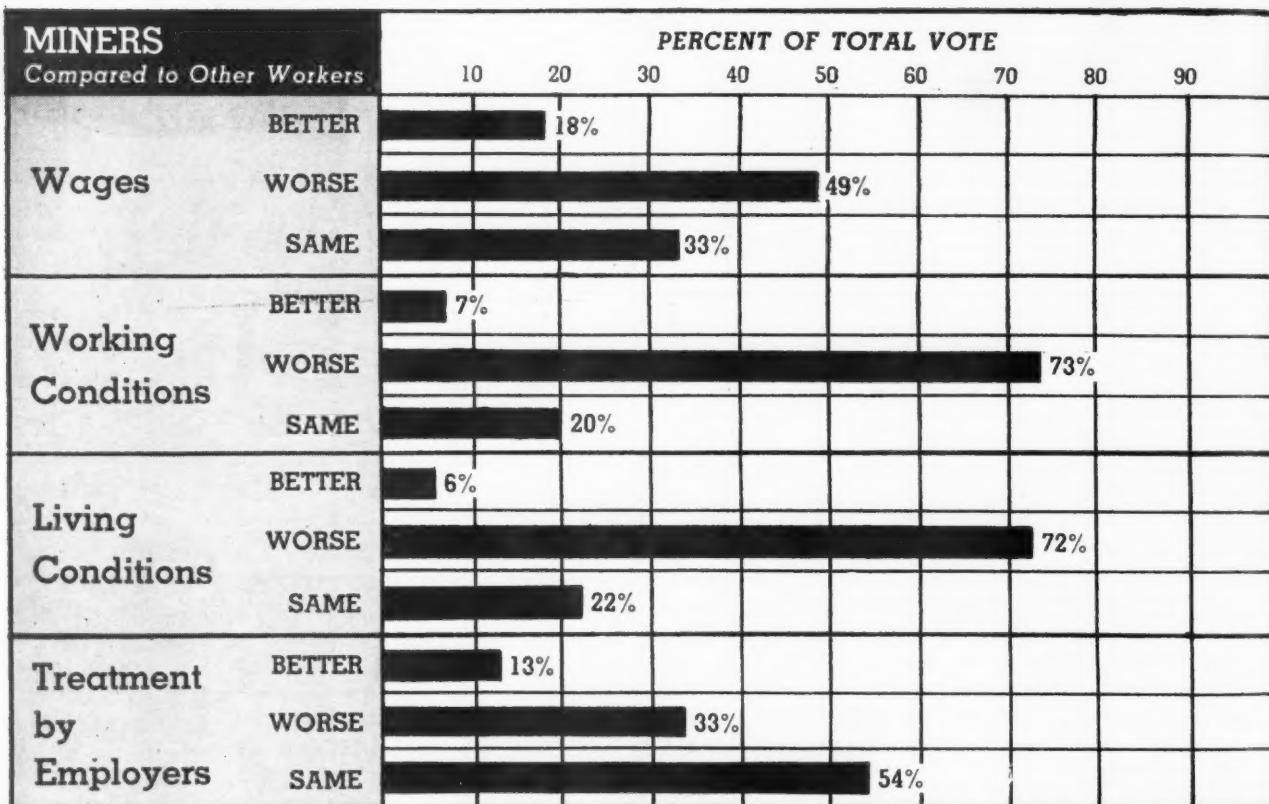
This is what John Q. and Mrs. Public told Coal Age:

Wages—The average coal miner is not paid as well as the average worker in other industries. While not too certain of this, John Q. was sure he wasn't paid any better, but guessed in a number of instances that his pay might be the same. What John Q. apparently doesn't appreciate is that in hourly and weekly earnings in April,

1943, as reported by the Department of Labor, anthracite and bituminous coal mining were exceeded by only five manufacturing and non-manufacturing groups: building construction, automobiles, other transportation equipment (including airplanes), petroleum and coal products and petroleum production. Anthracite earnings in April were: 105.4c. per hour and \$43.22 per week; bituminous, 112.8c. and \$41.39.

Working and Living Conditions—More than any other one thing, John Q. Public feels that miners' working and living conditions are worse than

HOW THE PUBLIC LOOKS UPON CERTAIN SH



those in other industries. He doesn't appreciate that working conditions are governed to a considerable extent by the nature of coal mining, although that is no sign that they are unduly onerous. And the industry has made sincere efforts at improvements. Coal's safety record, which shows a fatality rate of 2.225 per million tons in 1942, compared with 3.36 in 1932 and 13.47 in 1870, is definite evidence of substantial progress.

Why the public should hold such a low opinion of miners' living conditions is today a mystery perhaps explained in part by shrewd propaganda

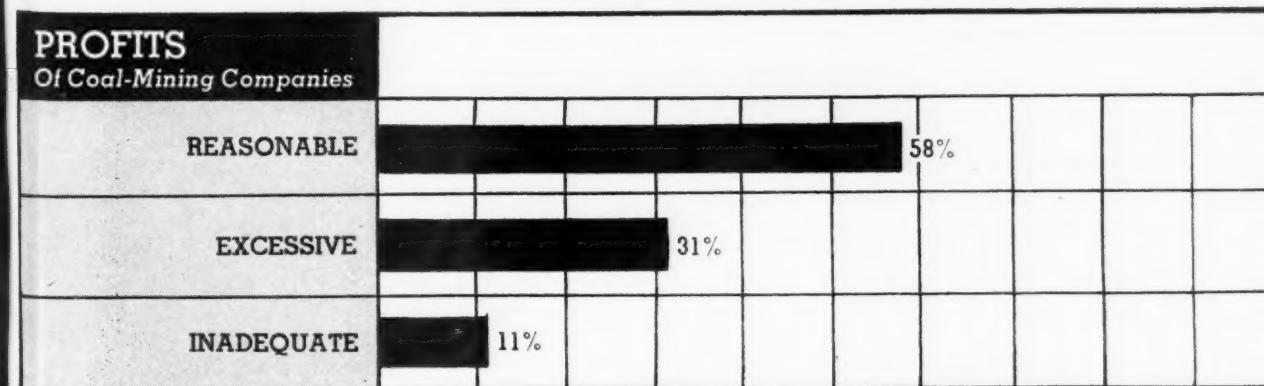
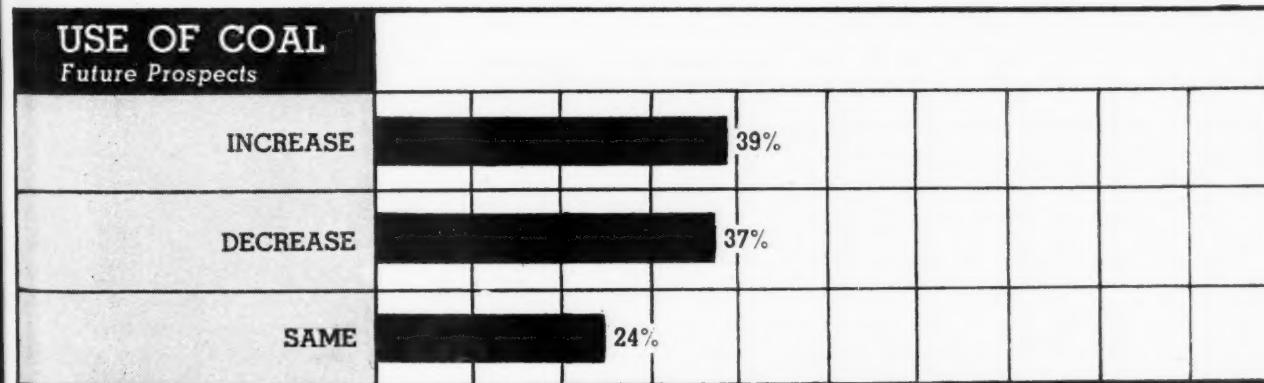
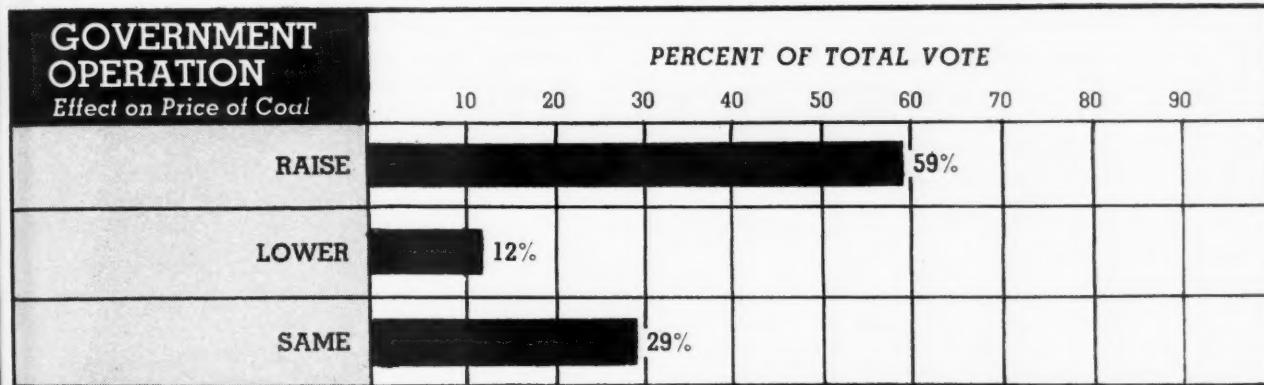
put out by John L. Lewis in combination with the inarticulateness of coal. A large part of the miners do not and never have lived in company houses or towns, choosing their own dwellings in independent communities. On the other hand, the average company town compares favorably with independent communities, and, if the coal companies' own interests were not sufficient incentive, there is a strong union to see that ownership of housing is not used to the employees' disadvantage.

Company stores also have provided much capital for the detractors of the

industry. What are the facts? Recent investigations by OPA and other government agencies, which certainly were not biased in favor of the employer, showed a definite balance in favor of coal-company stores in comparison with independent establishments even before the OPA enforcement drive. Regardless of what might have been said at other times, the company store today is run as a business establishment rendering a real service.

Treatment of Employees—More than 50 percent of the public believes coal operators deal as well with their employees as other industries. This

CERTAIN ASPECTS OF THE COAL-MINING PICTURE



average stood up both in and out of coal-mining areas. In the light of the overwhelming conviction that living and working conditions are bad, it is an important point to remember. It was one of the instances where John Q. had the right information. To the industry it would indicate that whatever story it has to tell has a good chance of receiving a friendly hearing.

Coal Prices as Affected by Changes in Wage Rates—The public let go with a scatter shot at this question. Although a plurality came up with the right answer (if they happened to be bituminous consumers), the replies demonstrated no clear knowledge of how much a \$2-a-day rise would cost the consumer. Actually, for anthracite, the increase would be about 70c. a ton; bituminous, about 40. A little more than 50 percent of the answers were

in that range, but the public obviously is much more inclined to underestimate the cost to the consumer of a pay raise than they are to overestimate it.

Government Control—Second only to John Q.'s belief that coal miners labor and live under poor conditions was his firm conviction that government operation of the mines would bode no good for the public. It probably will surprise and distress the advocates of paternalistic government to learn that the average American still wants business men to run business. Both in and out of coal-mining areas, consumers were convinced government operation would cost them money. No matter what else the public may believe of the coal operator, they are convinced he can produce better.

The Future of Coal—Aside from 25 percent foreseeing no change, the pub-

lic was divided almost evenly on whether the use of coal would increase or decrease. The industry knows that it should increase, if for no other reason than because of the growing volume of research being done to improve it as a fuel and as a raw material for the production of chemicals, rubber, liquid fuel and a long list of other products. But the public, perhaps influenced by the tag of "sick industry" and under the spell of its competitors' stories, is not too sure. But the returns indicate that it might be easier to convince than might be expected.

Coal-Mining Profits—John Q. tends strongly to believe that the coal operator's profits are reasonable. But those of a different persuasion were more inclined to call profits excessive than inadequate. A margin of 8c. on an average bituminous realization of \$2.35 a ton in 1942 certainly could not be called excessive. In fact, it was, if anything, inadequate. Here is another instance where coal commands perhaps unsuspected regard, which might easily be expanded to take in other aspects of the industry's operations.

Now and Then—Time has done little to change the public's outlook on coal. A survey four years ago (July, 1939, *Coal Age*) showed that John Q. Public then harbored many of the same impressions he now has. John Q. believed that operators' profits were fair (bituminous coal lost \$13,000,000), that miners were underpaid, but that operators voluntarily were taking steps to improve working and living conditions, which he felt were none too good. A majority of those interviewed expressed a preference for oil or gas. *Coal Age's* conclusion still holds: "John Q. Public and his brethren . . . are either ignorant, prejudiced, grossly misinformed, or apathetic."

The present survey points to two significant conclusions. First, there are a great many wrong impressions about coal deeply embedded in the public mind. Second, while the public may have these impressions, it harbors no active hostility toward coal or its operators.

The conclusion is inescapable. If coal wants to gain favorable public opinion for itself and its product, it must stop being the unknown industry and start telling its own story. No one else will. No one else can as well.

The public is willing to listen. It is up to coal to talk.

WHAT THE PUBLIC SAYS

Comments on the Coal Age public-opinion survey came in by the dozens. Some were favorable. More were not. Some typical ones follow.

"Heating with coal was all right 40 years ago. Let's have electric heat."—Cumberland, Md.

"Profits now reasonable; inadequate for years in the past."—Bellaire, O.

"Government operation will lead to inefficiency."—Jersey City, N. J.

"Coal miners would do well to rid themselves of John L. Lewis and his methods."—Hartford, Conn.

"I would not be a coal miner for \$100 an hour."—New York.

"Believe coal industry is 'middle aged' and about to decline in importance."—Terre Haute, Ind.

"Miners should have more money for the risks they take."—Johnstown, Pa.

"Labor and management in coal mining should make an honest effort to understand each other."—Charlotte, N. C.

"Bad working and living conditions more important than actual wage."—New York.

"Operators have had several price raises. Coal is higher today than the last war, wages lower."—Belleville, Ill.

"Ignorance and biased opinions will enter into most of these answers. John L. Lewis will win over the public anyway. He always has."—Columbus, Ohio.

PUBLIC RELATIONS IN ACTION



PUBLIC RELATIONS IN ACTION—Here, at the first press conference staged by the Bituminous Coal Institute, newspaper, magazine and radio representatives get the facts from J. D. Francis, Island Creek

Coal Co.; George W. Reed, Peabody Coal Co.; Grant Stauffer, Sinclair Coal Co.; R. L. Ireland Jr., Hanna Coal Co.; J. P. Williams Jr., Koppers Co.; and R. E. Jamison, Jamison Coal & Coke Co.

WHY are good public relations essential for coal mining—or any other industry? The answer lies in two additional questions: How is the coal industry known to the public? By what standards is it judged?

The evidence points inescapably to the conclusion that it is known and judged more by its controversies and its disasters than the good it has done in providing a decent livelihood for the men engaged in it and its undoubted accomplishments in producing a better and better fuel and raw material for industry and the home.

Good public relations therefore becomes just as important as—perhaps even more than—production, preparation, wages, labor relations, manpower or government mine operation, to name but a few. Parenthetically, it might be added that if the public had been fully aware of what coal is accomplishing and its importance to the war effort and the home front, it might not have had such problems as government operation and others of a like nature.

The next question might be: How much is it worth to get rid of the tag of "sick industry" and the other erroneous and false impressions which stick in the public's mind—\$1,000,000 a year? \$2,000,000? \$3,000,000?

\$5,000,000? Even \$5,000,000 is only 1/360 of the estimated value of the production in 1942—\$1,800,000,000. It is only slightly more than 4c. per ton on the total output of the anthracite and bituminous industries. Spent properly on national, regional and local understanding and goodwill, it should return itself many times over in better understanding of coal mining and acceptance of its product by the public in both coal-mining and non-coal-mining areas.

Other industries have met the same problems and have cashed in on good public-relations programs. The need is admitted in coal. In addition to work done in the past—some good, some not so good—two national organiza-

THE COAL OPERATOR IS Lucky IF HE GETS THE CORNER OF A \$2.00 BILL → 2

DID YOU EVER tear off the corner of a \$2.00 bill because such a bill is said to be unlucky? It's an old American superstition—and a very significant one in the case of the coal operator—because that little corner is about what the operator gets to keep out of the money he receives from the sale of coal.

This is not a careless statement of opinion but a fact supported by figures just published by the Bituminous Coal Division of the U. S. Department of Interior. These figures, which are shown graphically on the mutilated bill below, prove that the coal industry's net profit for the year 1942, after deduction of all costs and taxes, amounted to only 4 cents a ton out of an average realization of \$2.35 a ton!

In Detroit—Boston—Cheboygan—Richmond—anywhere the consumer buys his winter coal—he may pay from \$6 to \$16 a ton and the thought may strike him that the coal operator could well afford to pay the miner 18¢ per ton. But the consumer should remember that the coal operator does not get even half of the price he paid per ton. If the dealer's cost is 18¢, then the dealer's cost plus a fair profit to him. That leaves the operator with the net price of coal at the mine mouth—the \$2.35 shown here.

But the operator does not get all that \$2.35. Look at the things that happen to it in the drawing at the right. What the coal operator finally gets to keep is just 4 cents—a very small corner of the \$2.00 bill.

The picture above tells the story of how production costs were distributed last year. But it doesn't tell what the coal operator did with the "lucky corner" of the bill which he was allowed to keep. He received 4 cents as net profit from each ton of coal produced, but a big portion of that went toward the development of new mining projects, for improvement of miners' homes, sanitation and community betterment. Some of that money went for the support of churches, for the building of Y. M. C. A.'s and Y. W. C. A.'s, for swimming pools and community centers.

The Logan Coal Operators Association is a non-profit organization which seeks to raise the standards of the industry and to protect its members and its members'

employees against the hazards of unemployment and ruinous competition. The Association believes that West Virginians have a right to know the facts about

the State's "biggest cash crop." This advertisement is No. 26 in a series designed to prove to every reader of this newspaper that "What Helps Coal Helps You."

Logan Coal Operators Association

PUBLIC RELATIONS IN ACTION—A sample of how one operators' association functions effectively in creating goodwill in its region. The 26th in a series

designed to show West Virginians that "What helps coal helps you" and "What hurts coal hurts you," this advertisement presents the facts on profits.

tions now are available to carry on—Anthracite Industries, Inc., and the Bituminous Coal Institute. Through these, and through regional and local organizations, coal now has an opportunity to achieve a real objective: public confidence and respect.

There is nothing mysterious about good public relations. Even if knowledge and experience were not available in coal, other industries have developed the fundamentals. Regardless of the approach, time and experience have proved the following:

Good public relations must be earned. It can't be bought.

Good public relations requires the united support of all members of the industry it seeks to serve. It must encompass the entire industry, from the greatest of the employers to the least of the employees.

Good public relations demands that the industry's house be in order.

Good public relations must be continuing and persistent. No miraculous results must be expected from some form of black magic or wand waving.

Good public relations can be achieved only by placing the job in the hands of a full-time expert backed by the necessary organization. Making it the hobby or part-time task of an

executive whose main responsibility is something else is an invitation to failure.

Setting aside for the moment the industry's labor-relations problems, coal must cope with perhaps three major difficulties:

1. A considerable body of public belief that it is a decadent, dying industry, and that coal will be replaced by other more modern fuels and sources of energy.

2. Susceptibility to government investigations and seizure, as well as other outside interference, as a result of widespread belief that the industry's affairs are mismanaged with consequent waste of an irreplaceable natural resource.

3. Inherent and natural difficulty in getting together on an industry-wide program as a result of diverse ownership and wide dispersion of facilities.

These problems, to use a masterpiece of understatement, are knotty. Yet they are not impossible of solution. Other industries have faced similar ones—perhaps not all at once—and whipped them. And certainly joint action in public relations is something that all elements in coal should find it easy to accept, even though they might differ materially on other things.

dustry was losing ground, and if that belief became prevalent among freight customers, it eventually would damage the railroads beyond repair.

The association also found, strange as it might seem to an outsider, that too many railroad men shared the public's opinion that railroads were slipping. So one of its first jobs was to sell railroad men on railroads. Does that offer food for thought in the coal industry?

The association observed all the cardinal rules of public relations, and saw to it that its program was followed through by State associations and individual roads—that the gospel was carried by railroad employees and officials right down to the local service club and the schoolroom.

All the normal channels of dissemination of public information were used effectively by the railroads, but the philosophy was the important thing. When the problem is recognized and the proper approach decided upon, any competent advertising agency or public relations counsel can handle the mechanics. And while prohibited from entering into labor relations by its charter, the association does provide material to individual carriers for motion pictures and lectures, employee meetings and house organs designed not only to make the employee proud of his job but also explaining the economic structure of the industry. As a result the average railroad worker has a much higher regard for his calling in late years.

How would the public react today if the government seized the railroads as it seized the coal mines? No one knows exactly, but some indication can be gathered from the man-in-the-street's conviction that the railroads are "doing a good job." And that despite the fact that some of the time he cannot get a seat on the train. The war helped to dramatize the A.A.R.'s job. But some credit must go to recognizing the fact it could be dramatized.

For light on problems of government intervention and public heckling Coal Age went to the American Telephone & Telegraph Co., a monopoly and a utility which comes in contact with its customers a million times a day. Well within the memory of even some of our youngest citizens, it was a popular American sport to investigate the telephone company. But a few years ago when the Temporary National Economic Committee launched an investigation of the telephone company, it collapsed of its own weight, with no public mourners at the burial.

This change did not come about

Selling Modern Facilities and Service

To learn what other industries did about problems similar to those revealed by the public-opinion poll summarized on pp. 46-50, Coal Age went to the railroads, American Telephone & Telegraph and the Brewers' Foundation. The railroads now boast excellent public support under the most trying conditions. Five to ten years ago, however, public-opinion surveys showed that the man in the street considered the railroads to be asleep on their feet, their freight business rapidly going to motor trucks, with the airplane next on the horizon. And passenger travel on rails was considered old-fashioned—smart people rode the airways.

The railroads decided something had to be done about it. In 1935 the idea of the American Association of Railroads was born, not exclusively to improve public relations but with that as one of its major goals. What did the new association find? Among other things it discovered, like coal, that the railroads had made many startling changes, wrought many improvements in service, and forgotten to tell anyone about it except themselves.

A major association objective was informing the public of the "progress, achievements, and problems" of the railroads. Note well that "problems" were carefully and deliberately placed last on the list. "Don't do too much crying in public about your own problems," is the way one public-relations authority puts it.

A public-relations theory is that any industry seeking to improve its standing must select "the lowest common denominator" on which to work first—in other words, some subject of fundamental concern to all the industry. In the case of the railroads, it was freight haulage. The A.A.R. found the railroads had revolutionized their freight system, but had said nothing to their customers. There was stiff resistance toward advertising or telling about freight haulage, on the ground that those who bought it already knew about it and those who could not buy it did not care. In other words, the railroads asked the association: What is the sense in telling the public about freight haulage, since the public is not a consumer? The answer to this was that the public believed the in-

Coal, too, has its "Motorized Transport"



...with war-time problems

The first anthracite sold was peddled by the founder of this business from a horse and wagon. That was more than a hundred and twenty years ago.

Today the delivery of Old Company's Lehigh anthracite is big business. It engages the talents of hundreds of independent coal dealers with regiments of trucks and handlers. To hundreds of thousands of homes throughout the populous northeastern portion of the United States, the coal truck with the Old Company medallion is a familiar and welcome sight.

The dealers who handle Old Company's Lehigh are selected dealers, chosen for responsibility and progressiveness. They have modern equipment, and that, of course, means trucks and gasoline with all the difficulties of priorities and rationing.

They can get few new trucks. Rubber tires are a problem and so are manpower shortages. Office forces have been depleted while telephone calls have multiplied.

Despite these handicaps, Old Company dealers have carried on with a valiance worthy of medals. They have delivered coal in all weathers. They have distributed coal fairly, as needed, in order to supply as many homes and business places as possible along with the imperative needs of schools and hospitals. During the past winter, with fewer trucks and men, they delivered 38 percent

more coal and greatly helped to relieve the distress caused by shortage of other fuels.

Fortunately, a great deal of modernization work at the mines had been completed before the emergency arose. With new equipment and the earnest cooperation of miners who have been working more days per month than for many years, the Company has been able to increase output by large percentages. In the first seven months of this year, the Panther Valley mines produced 669,000 tons more coal than in the similar period in 1942. In July of this year more coal was mined by the Company than in any one month in its history.

Although much of this coal is required for war industries, every effort is made to supply dealers with quantities sufficient for the urgent needs of their customers.

This Company is proud of the dealers associated with it and recognizes their mutual interest in the future of the anthracite industry.

The Lehigh Navigation Coal Company Inc., which operates the Panther Valley mines and markets coal, is a wholly-owned subsidiary of this Company. It is one of a closely-integrated system of enterprises, including mines, railroads, manufacturing, distribution and water supply which are conducted under this one centralized direction.

Lehigh Coal and Navigation Company



PUBLIC RELATIONS IN ACTION—Coal's part in supporting the war effort and the home front is the theme of this sample message to the public from an

individual anthracite company. It conveys the facts about how the industry has planned its operations to serve the consumer more economically.

overnight. For 30 years and more, the telephone company has been hard at its chore of better public relations, which, in that organization, goes more frequently under the name of better service. In 1927, the company made a publisher and magazine editor its vice president in charge of public relations—almost the first of the A. T. & T. executives not to come up through the ranks, once more demonstrating the truth of the policy that public relations cannot be handled adequately by anyone except a public relations man.

A. T. & T.'s policy on public relations is so simple it seems almost too fundamental. It is summed up in one word—"service." It is a company byword that no complaint goes unheeded, no matter from how humble a source, and that if it is correctible, money, time and trouble are no objects.

This idea of service being the best public relations permeates the whole organization with the knowledge that without it the company cannot do an efficient public job. It becomes part of employee training and it sticks with every employee, president to repairman. A. T. & T. likes to tell the story of the workman who was repairing a switch on a subscriber's large executive desk. The executive watched for

a moment or two, and then inquired:

"What are all those gadgets you've got in that bag?"

"Brother," came the reply, "them ain't gadgets; them's the best damn tools money can buy."

Pride in his work, pride in the service the company gives, and pride in his job. Those things A. T. & T. feels comprise one of the more profitable paths to harmonious public and labor relations.

The popular opinion persists that the telephone company "is a pretty good bunch to work for." The company believes that opinion is shared by the employees. It is not due entirely, the company likes to think, to any outlandish wage scale (its 1940 average was \$37 a week) or to any unusual benefits, although it has all the normal sick and retirement plans. Rather it is ascribed to the way the average employee feels about his own job.

The telephone company's philosophy of public relations is summed up in a statement which, if analyzed, reveals all of the main points in building good public opinion:

"The adjustment of big business to the public is of as much importance to the public as it is to business and it cannot be done without frankness and understanding."

ment careful study by the coal industry. It asked the public what it thought should be done to enable the industry to give respectable, wholesome service. Upward of 50,000 letters suggesting improvements were received from persons in every walk of life. From the major principles proposed came the Brewers' Code of Ethics. Then came the process of informing the public. Up to that time not a line of paid advertising had appeared. "Don't try to tell something when you haven't anything to tell," was the watchword.

Not only did the brewers sign the code of ethics but they lived up to it, lived up to it so well that the hallmark of the Foundation on tavern advertising is today a virtual guarantee of a clean, well-run, law-abiding beer dispensary (the practical application of "set your house in order first").

The brewing industry raised another point which should interest the coal industry. It realized that only on rare occasions did the brewer himself come into contact with the consumer, that the consumer's only experience with the men in the industry was through the retail dispenser of beer. It saw quickly that any public-relations program must include the retailer; that if he failed to do his part, the industry's primary contact with the consumer was lost. So the retailer was made an integral part of the Foundation's program, and the Foundation and the brewer helped by supplying him with material and working with him in any way they could.

The coal industry's problem presents some striking parallels. Unlike the telephone company, which comes in contact with a customer every time he picks up an instrument, coal meets its domestic consumers only once or twice a year, and then in almost every case through the retail dealer. It seems evident that any industry program should include the outlet nearest to the public's consciousness.

What other industries can do, coal can do. The problem is not new. In 1936, for example, when the Brewers' Foundation was being organized and the Association of American Railroads was trying its first wobbly underpinnings, it was stated thus: "The 'doddering condition of the industry depicted by the press is due to the woeful lack of coordinated publicity on the part of coal." In 1939, one prominent operator put it like this: "We must tell the public more about what we have to sell and why they should buy. . . . We need to quit apologizing for being in business. We should take the offensive instead of the defensive."

How does coal stand today? The

Solving Internal Problems in an Industry

To obtain some idea of how the problems of diverse ownership could successfully be eliminated, Coal Age went to the United Brewers' Industry Foundation. The brewers' pay-off on good public relations was a wartime government directive to earmark 15 percent of their product for the use of the armed services. It is easy to conceive that this was an industry whose product might easily have been dismissed as a wartime luxury. Instead, this directive was proof that it had adjusted its operations to the satisfaction of both government and the public, and had told its story well.

To paraphrase Jefferson: No industry in the United States knows better than the brewers that "eternal vigilance is the price of good public relations." Here is an industry under constant threat of unfavorable legislation, opposed day and night by a doughty, well-financed and literate opponent. But it was not so much on that score that Coal Age approached the Foundation. Rather, it was because a number of parallels between brewing and

coal mining immediately presented themselves. No brewer manufactures more than 5 percent of the nation's total gallonage, just as no coal operator mines more than 3 percent of the nation's output. Like coal, brewing had hundreds upon hundreds of operators, making the problem of joint action correspondingly more difficult. Like coal, too, it had its State and local associations to be interwoven into any industry-wide missionary work. And, like coal, but for entirely different reasons, of course, the brewers had to break down product resistance.

The first step in the Foundation program was unity within the industry. It did not come about by one pep meeting. It did not come about by a few conferences in key areas. It came about by two to three years of hard work, two years of selling, and two years of showing the reluctant ones, by precept and example, what the association could do for them.

Once united, the Foundation started to work in earnest. It hit upon a brilliant stroke—a stroke which might

machinery for implementing a good public-relations program has been or is being set up and has started to function. What's more, it is beginning to get results—to uncover the fact that the public is willing to give the industry's story a fair hearing if it will just tell it. As the program develops and more and more support is received from the industry, the benefits will increase. Industry-wide support is the vital factor, and the closer it comes to being achieved the sooner coal will begin to reap to the fullest the rewards of public understanding and acceptance of its product.

The problem is more, however, than merely contributing to an industry organization and leaving it to do the job. It is a cardinal principle of good public relations that, like charity, it begins at home. It begins with the interest and cooperation of the employee of each individual company and the residents of each community in the mining regions. Company and association work must complement that of the industry organization. Already, a number of companies and operator associations have shown the way and are benefiting from the good-

will engendered by taking the public and their employees into their confidence.

What, then, is the job for coal? A start has been made and some of the necessary things have been done. But, remembering that "public relations is not a gesture but a way of life," the job in any industry stacks up about as follows:

Establishment of an organization staffed by competent, trained men to speak for the entire industry. Such an organization acts as a clearing house for news and information and provides the machinery for getting such news and information to the public. Organizations already are functioning for the anthracite and bituminous industries.

Extension of public relations work down to State and local associations and individual producers and enlistment of employee and dealer cooperation. An industry organization can do a good job but the cooperation of regional groups and individual companies pyramids the effect.

Wholehearted industry-wide support. The greater the support, the more the funds available. At the same

time, the cost to each individual of doing an effective job is materially reduced.

Analysis of internal conditions and correction of those that need it. Setting its own house in order first is the surest guarantee of public acceptance of the industry's story at its face value.

Finally, discarding at once and for all the belief that what the public doesn't know won't hurt them or the industry. The fact is that what the public doesn't know does hurt. This has been proved both in coal and other industries. Lack of information, misinformation and hearsay all too often lead to prejudice, ill-will and reluctance to accept the industry's product—the product from which its livelihood is derived.

Coal now has the opportunity—a better opportunity than ever before. And the public is inclined to be receptive. By telling its story well and truthfully, and telling it long enough and often enough, it can realize all the benefits of public confidence and respect, which inevitably lead to better business and greater prosperity for both owners and employees.

VITAL FACTORS IN PUBLIC OPINION—As much as any other one thing, the Coal Age survey shows, relations between employer and employee influence

the public's opinion of the coal-mining industry. All the more reason, therefore, for making the facts known, not only to the public but to the employee.





Dustless coal helps make modern basements possible and thus improves coal's opportunity. The war has complicated the problem, but satisfactory materials still are available.

DUSTPROOFING COAL

With Materials Available in Wartime*

By GEORGE W. LAND

Research Engineer
Battelle Memorial Institute
Columbus, Ohio

TIME WAS when the most frequent cause of complaint from household users of coal was the dust spread over the basement and the house when a delivery was made. This difficulty became particularly acute when the smaller sizes of coal required for the residential stoker came into use. But this problem was practically entirely overcome by the development of dustless treating materials.

Among the early materials used were calcium chloride and mixtures containing calcium chloride. Later petroleum oils were widely adopted. In the early days, many retail dealers installed spraying equipment in their yards, but later treatment was taken over by the coal producer. Research conducted by Bituminous Coal Research, Inc., and some of the leading producers of oil developed information on the proper types of oil and the proper quantities to apply to coals of various sizes from the different seams.

*Abstract of a paper presented at the 1943 convention of the Ohio Coal Conference.

Now that we are at war, petroleum oils and particularly tank cars are required to furnish fuel to our armed forces. For the last year, the use of petroleum products for the treatment of coal has been forbidden except for the stocks on hand when the order became effective.

The question before the coal industry has been whether it would revert to previous practices and deliver untreated coal with the explanation that it was a war necessity or whether it would use other materials. Most forward-looking producers and retailers feel strongly that they should not revert to the old practices but should search for new ways to treat coal that they may continue to satisfy the customer. Of particular importance is the fact that the coal industry now has many new customers, those who formerly used one of the competitive fuels but who, because of rationing, returned to coal as the fuel with which they could keep warm in war as well as in peace. If dustless coal is delivered to these customers, there is a chance to retain them after the war.

Bituminous Coal Research, Inc., has been intensively working for the last year on the characteristics of dustless treating materials available in

time of war. Every possible type of material is being investigated, but, because calcium chloride was the original dustless treating material, because some producers used it during the period when oil was available, and because it is available in ample quantities, it has received the greatest attention. The Calcium Chloride Association has joined with the coal industry in support and conduct of this work.

Data have been obtained on the relation of the quantities of calcium chloride, and of "Coaladd," a proprietary product containing calcium chloride, to the dustiness index of a number of typical coals, and on the rate of change of dustiness with time after treatment. The subject of corrosion also has been studied. The research continues and the highlights of the data on these materials together with some information on other products that we have investigated can be considered only as a progress report.

Coal Used—Because coal is a porous material, any treatment applied to the surface is likely to be absorbed to a certain extent. For this reason, the criterion used to select coals for this study was the inherent or bed



WHAT DUSTINESS INDEX VALUES MEAN



Fig. 1—50-lb. samples of five coals with the coarse-dust indexes shown are dropped from a hopper-bottom box into a tub. The movie frames show, from top to bottom, the falling coal and the dust produced.

moisture content, which is a measure of its porosity.

The coals used had inherent moisture contents of 1.6, 3.2, 8.0 and 18.4 percent. They were, respectively, Cary seam from Virginia, Elkhorn coal from Kentucky, Hocking or Ohio No. 6 coal, and an Illinois No. 6 coal.

Attention is directed to the fact that although the coal of the highest moisture content came from the Illinois No. 6 seam, all of the coal from that seam does not have a moisture content of that order. Much of it will be considerably lower in moisture and porosity as will other seams of Illinois. The coal selected was not typical of Illinois coals but only typical of coals of high moisture content.

Method of Treatment—These four coals were treated with calcium chloride and "Coaladd," and dustiness tests were made of the untreated and treated coals after periods of storage of one week, one month and three months. "Coaladd" was applied in the form of a solution of 2.2 lb. per gallon and applications were made with a Viking treating machine. Calcium chloride was applied to the coals both in the dry flake form and in solution. Solutions were applied in the same manner as were the "Coaladd" solutions. Dry-flake calcium-chloride applications were made by spreading a weighed quantity of flake over the coal spread in a thin layer on the floor. After treatment, all samples were carefully mixed by shoveling, separated into 110-lb. lots and stored indoors for the required time.

Measure of Dustiness—Dustiness tests were run in the A.S.T.M. dustiness cabinet in which a 50-lb. sample of coal is dropped. The dust produced by dropping the coal is collected on polished metal slides and weighed. The coarse dust is that which settles in the first 2 minutes after dropping and represents the dust which would settle in the neighborhood of the coal bin when coal is dumped into a basement. The float dust is that which settles in the next 8 minutes and represents the dust which floats through the house.

Before testing for dustiness the samples were allowed to come to equilibrium with an atmosphere of 50 percent relative humidity. This value was chosen as a compromise between the high relative humidities outdoors and the low humidities of heated basements.

Fig. 1 provides an idea of the mean-

ing of the dustiness index values that I shall quote. Fifty-pound samples of five coals having the coarse-dust indexes shown in the figure were dropped from a hopper-bottom box into a tub and movies were made of the falling coal and the dust produced. The first two frames in each vertical set show the coal entering the tub. The next frames show the rise of the dust. The total time elapsed from the first to the sixth frame is three-eighths of a second. It can be seen that 400 and 300 dust-index coals are very dusty. The coal with an index of 200 is considerably less dusty than the 400 or 300, but there is still an objectionable quantity of dust. Coal with an index of 100 shows some dust but the quantity probably is not objectionable, while coal with an index of 50 has practically no dust. Untreated double-screened stoker coals have dustiness indexes ranging from 250 to 500 while some slack coals may be even higher.

Fig. 2 shows the results of dustiness tests one week after treatment of the four coals with calcium chloride at rates of 5, 7 and 10 lb. per ton. It can be seen that on all except the high-moisture Illinois coal calcium chloride has effected a considerable reduction in dustiness when applied at the rate of 10 lb. per ton. Fig. 3 shows the results of treating Hocking and Elkhorn coals with 2, 4 and 6 lb. of "Coaladd" per ton. Both coals are satisfactory at one week when treated with 6 lb. per ton, and possibly when treated with 4 lb. per ton.

Permanence of Treatment—Materials used for dustless treatment of bituminous coal have been found to lose effectiveness as the time after treatment increases. This was true of petroleum oils and also is true of calcium chloride and materials containing calcium chloride. This loss of effectiveness with time has been found to be caused by absorption of the treating material into the pores and cracks of the coal particles. Because coals vary in porosity, the rate of absorption of the treating materials also varies. Coals with higher inherent moisture contents, such as the 18-percent-moisture coal used in these tests, have high porosity and consequently are very absorptive.

Fig. 4 shows the results of dustiness tests one week, one month and three months after treatment of the four coals with 10 lb. of calcium chloride per ton. At one month the dustiness indexes of the three lower-moisture coals are still under 200, and at three months those of the two low-

moisture coals are under 200. While the dustiness at three months is too high to be considered entirely satisfactory, it still represents a considerable reduction over that of untreated coal.

Fig. 5 shows the same results for "Coaladd" treatments of 6 lb. per ton on the Hocking and Elkhorn coals. At one month both of the coals probably are satisfactory. At three months only the Elkhorn coal could be considered entirely satisfactory, but the reduction in dustiness of the Hocking still was considerable.

These figures show that a large reduction in the dustiness of stoker coals can be achieved even after three months of storage with calcium chloride or "Coaladd" if enough is applied. This quantity should be 7 to 10 lb. of calcium chloride or 6 to 7 lb. of "Coaladd" per ton of coal.

The Corrosion Problem—An objection to the use of calcium chloride and materials containing calcium chloride for the dustless treatment of coal has been the possible corrosion or rusting of metals with which the coal may come in contact. Rusting is essentially a process of oxidation—that is, a combination of the metal with oxygen. Dry air will not rust iron, and pure water will not attack iron appreciably, but water containing dissolved oxygen will react with iron and steel. This action is electrolytic—that is, it depends on the electrical conductivity of the water. For this reason, the presence of any salt in the solution will tend to accelerate rusting.

Calcium-chloride solutions are used for brines in the refrigeration industry with no serious effects from corrosion of the iron pipes. Under these conditions, however, the metal is completely and continuously immersed in the solution and the oxygen content is low.

Although calcium chloride or any salt dissolved in water is expected to lead to an accelerated rate of rusting of iron or steel as compared to water, the fact that many companies have used calcium chloride for years for dustproofing and freezeproofing without serious difficulty from rusting proves that it need not be serious. Care in washing down at frequent intervals the metal surfaces exposed to the treating solution and painting the surfaces with chromatic primer or red lead and chromate paint should reduce the difficulty to a minimum.

Contrary to a popular misconception, calcium-chloride solutions are not acidic if the water from which they are made is not acid.

Failure of Stoker Screws—The complaint frequently is made against calcium chloride that it destroys the feed screws of domestic stokers. The failure usually consists in the wasting away, often to the point of complete disappearance, of several flights at the retort end or, more commonly, of several flights a short distance from the retort end of the screw, with the last one or two flights in good condition.

Several screws of residential stokers have been examined in the course of this study. Some had failed com-

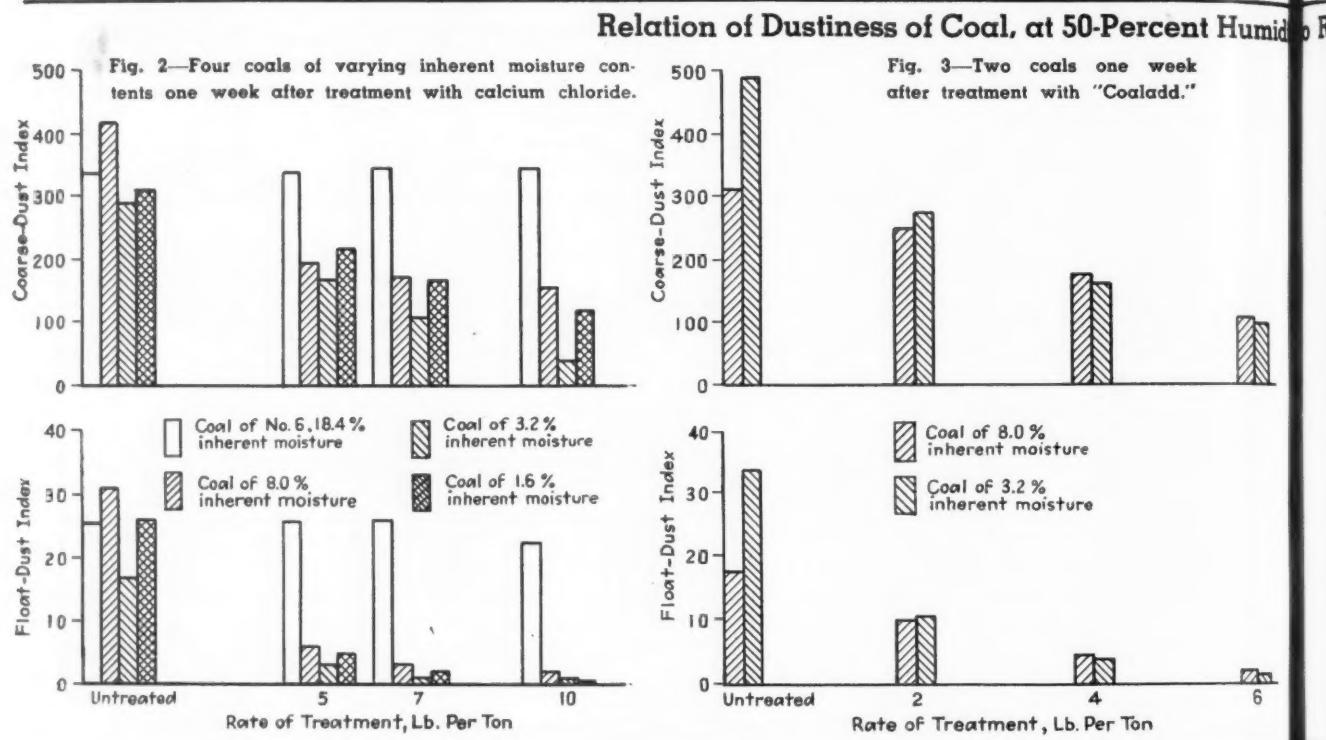
pletely in two or three years. Others were in perfect condition, one after four years' service. All had used the same coal treated with a material containing calcium chloride.

calcium chloride or materials containing calcium chloride have trouble of this type it is evident that the conditions necessary for the liberation of acid from calcium chloride do not occur in most normally operating stokers. Proper adjustment of the stoker should do much to overcome this trouble. The air-coal ratio and over-fire draft should be so adjusted as to give a moderately heavy fuel bed to prevent burning low in the retort. Clinker should be removed at proper intervals, as clinkers overhanging the

wetting agents and some miscellaneous materials. The most promising of these have been the turpentine residue and the vegetable oils.

A turpentine residue was found to give a satisfactory treatment after three months' storage when applied at rates of 1 to 1½ gal. per ton to the Elkhorn coal. There is only a limited quantity of this material available, however, and it is understood that it is all being used by one large producer.

The vegetable-oil compounds are being investigated in cooperation with



pletely in two or three years. Others were in perfect condition, one after four years' service. All had used the same coal treated with a material containing calcium chloride.

Consideration of the facts surrounding the failure of the stoker screws indicated that elevated temperatures occurring in the feed tube or lower retort during normal operation might be related to the failure of the screw. Calcium chloride of the type obtained when a solution is evaporated is decomposed to liberate hydrochloric acid gas when heated above 350 deg. If this gas should diffuse back into the feed tube and dissolve in the water on the coal, a solution will result which, of course, will attack the steel rapidly.

Tests have been made on a small stoker which show that this action does occur. However, because not all the stokers using coal treated with

edge of the retort may deflect air downward into the retort and result in high temperatures in the feed tube. These adjustments are easily made and should be made not only to avoid any difficulty from excessive temperatures in the feed tubes but also to obtain the best performance of the stoker.

Further research is in progress to develop methods to prevent the liberation of acid under any conditions.

Other Materials—In addition to the work being done on calcium chloride and materials containing calcium chloride, Bituminous Coal Research, Inc., also is sponsoring work on other materials which may be suitable for dustless treatment. To date, investigations have been made of several paper-mill liquors, vegetable oils, residues from the turpentine industry, different industrial sugars, several

a manufacturer of vegetable- and animal-oil products.

In addition to these materials investigations also are being made of possible addition materials for calcium chloride which will increase its performance.

Treatment With Water—If a retailer has coal in his yard that has not been treated or has been so poorly treated that it obviously is dusty, treatment with water before delivery may be the only method to insure that the coal will be dustless at the time of delivery. This should be done carefully and not haphazardly.

The application of about 2 percent of water to the surface of the coal usually will be enough to make a coal satisfactorily dustless for delivery. This amounts to 40 lb., or less than 5 gal., per ton of coal. The best method is to arrange a nozzle or nozzles on the

automatic loader that will spray a fine mist of water on the coal at the proper rate. Calibration of the nozzles for the city-water pressure available in coordination with the rate of flow of the coal will insure that the proper quantities will be applied.

Treatment with water, of course, will have no permanence. If coal must be delivered treated in this way, the customer should be advised to sprinkle the surface of the pile lightly at intervals during the year to keep down the dust.

mines where cutter bars are wetted with water containing a wetting agent or such water is sprayed on roadways and in tipples to keep down the dust.

These wetting agents are chemical compounds, often complex, that are effective in quite small concentrations—usually 0.05 to 0.2 percent, or 4 to 16 lb. per 1,000 gal. of water. Among those that are very effective on coal are "Aerosol OS," "Tergitol Penetrant 4," and "Wetsit." The cost is of the order of 35c. per pound. Assuming the addition of 8 lb. to

steel somewhat more rapidly than will water, but with reasonable care and "good housekeeping" no serious damage should result. The evidence on the serious corrosion of stoker screws is not complete, so it is not possible at this time to state what percentage of failures may be due to calcium chloride and what percentage may be due to other causes. It has been proved that overheating of the feed tube will result in the liberation of acid which will attack screws rapidly, but means to prevent overheating are

Humidity Rate of Treatment and Time of Storage Indoors

Fig. 4—Four coals after treatment with 10 lb. of calcium chloride per ton.

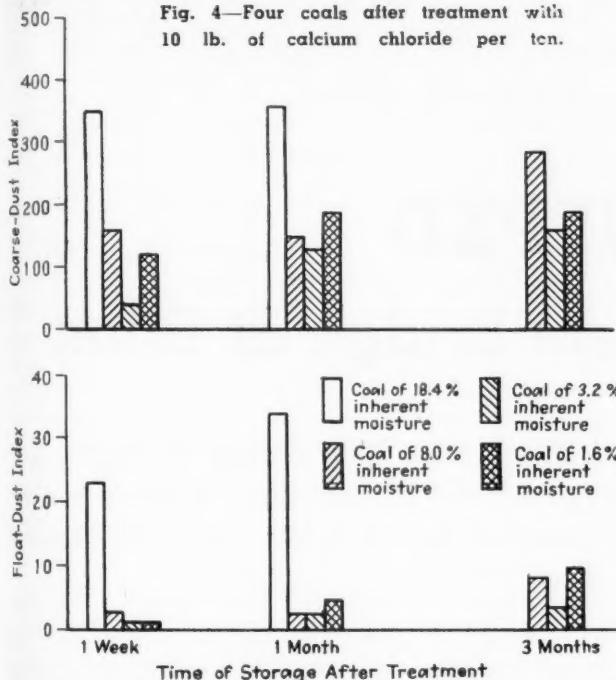
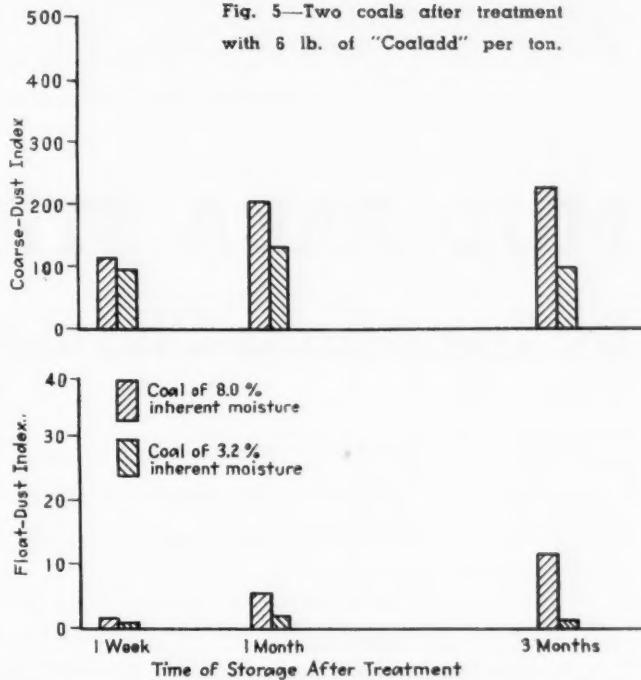


Fig. 5—Two coals after treatment with 6 lb. of "Coaladd" per ton.



The advice to sprinkle the pile with water, to seal the coal bin and to keep it cool also are excellent suggestions to pass on to the consumer to whom coal is delivered treated with calcium chloride or "Coaladd." Any measure to increase the humidity of the storage room will increase the quantity of moisture held on the coal and thus decrease its dustiness.

The customer should be warned not to sprinkle the coal more often or more heavily than necessary to keep down the dust because wet coal will arch in the stoker hopper and cause rusting of the stoker metal.

Use of Wetting Agents—Coal, particularly coal dust, is not readily wetted with water, but if a wetting agent is added the coal may be instantly wetted and the quantity of water required appreciably decreased. This is now common practice in many

1,000 gal. of water and the use of 5 gal. of water per ton of coal, the cost per ton of coal will be of the order of 1½c. If, as is probable, the quantity of water can be reduced to 2½ gal. per ton of coal, the cost will be ¾c. per ton of coal.

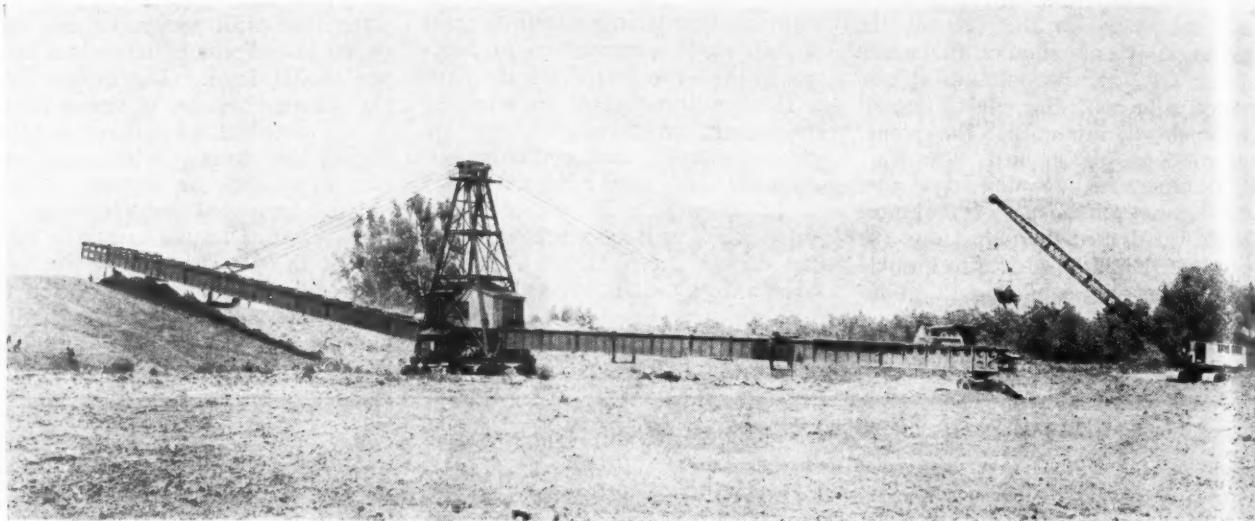
Use of this material will not increase the permanence of the treatment with water as it does not slow up evaporation, but it will make the coal easy to wet a second time.

Summary—The data we have obtained show that calcium chloride or materials made with calcium chloride, such as "Coaladd," will treat coal for satisfactory dustless delivery when used in adequate quantities. Although the dustiness will increase with time of storage, it will be much less than if the coal is untreated or treated only with water. Treating solutions containing calcium chloride will rust iron and

known and it is hoped that means may be found to prevent acid liberation.

No other material that is available in quantities required to treat the country's production of domestic coal has yet been found, but investigations are continuing along this line as well as on the improvement of calcium chloride.

The coal industry, through its research organization, Bituminous Coal Research, Inc., is attempting to find the best possible treating material so that delivery of dustless coal to consumers may be continued. The coal producers, for the most part, are using some type of treatment. The retailers, however, are the last and most important link between the mines and the domestic consumer. They learn directly what consumers like and don't like, and they can render a real service by passing this information on to the producer.



Chambers bridge in action on its original job—levee building.

MUD AREA STRIPPED

By Installing Chambers Bridge at Enos

Bridge Proves Effective in Mud Overburden That Baffled Scrapers and Walking Dragline—Production of 300 Cu.Yd. per Hour Achieved With Unit Fed by Dragline—Mud Deposited Behind Levee Made of Top Soil

By G. H. UTTERBACK

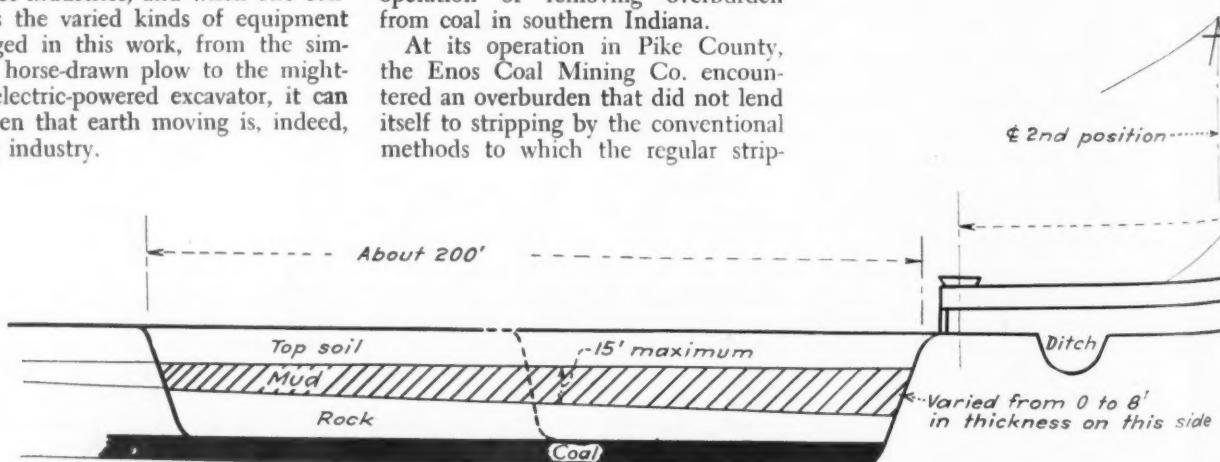
Production Engineer
The Enos Coal Mining Co.
Oakland City, Ind.

IT HAS BEEN SAID that moving earth from where it is found to where it is wanted is one of this country's biggest industries, and when one considers the varied kinds of equipment engaged in this work, from the simplest horse-drawn plow to the mightiest electric-powered excavator, it can be seen that earth moving is, indeed, a big industry.

Special machines have often been built for particular earth-moving jobs and are sometimes used on work other than that for which they were built. For instance, from flood-control work to strip coal-mining may seem a far cry. Each is, however, essentially an earth-moving job and, in at least one case, equipment specially designed for levee building has been applied to the operation of removing overburden from coal in southern Indiana.

At its operation in Pike County, the Enos Coal Mining Co. encountered an overburden that did not lend itself to stripping by the conventional methods to which the regular strip-

ping machines are limited. The instability of this material, which varied from nothing to 15 ft. in thickness, caused it to assume a slope of about six to one when placed in the open. In some places the troublesome material, which underlay the top soil and consisted of a bluish, sticky mud containing some sandy or granular mate-



rial, composed as much as 60 percent of the overburden.

With shovel operation it was impossible to prevent some mixing of the top soil and the mud, which succeeded only in making the entire mass uncontrollable. Although the portion of the field underlain by the mud consisted of only about 30 acres, efficient stripping of a considerably larger area depended upon the removal of the mud area first. To complicate conditions further, a large drainage ditch skirted the area to be opened up, making it necessary for the spoil to be handled across it.

In casting about for a method to dispose of the troublesome material, several ideas were discussed. Scraper were helpless because the material would not support a wheeled vehicle; a small walking dragline, the only kind available, could not do it without rehandling at least once, and much of the material would not stand long enough to permit rehandling.

How the Bridge Works

The Chambers Bridge, invented by John T. Chambers and built by Bucyrus-Erie Co. for levee construction work, was called to our attention. The bridge had been used also on construction of the Atlantic-Gulf Ship Canal. This machine consists essentially of a mobile tower from which are hinged and suspended two plate-girder cantilevers through which runs a track system for the travel of a load-carrying car. On the base is mounted the machinery for moving the car from the receiving to the dumping position and return; for propelling the machine, and for varying the vertical angles of the cantilevers or bridges. The car is controlled by a system of haul and rehaul cables.

Loading can be accomplished either directly into the car or by means of a feeding hopper that is dumped and

discharged by a tripping mechanism as the car runs under it. Maximum travel distance of the car from the loading hopper to the extreme dumping position is 350 ft. As the car passes into the discharge end of the bridge a sliding shoe makes contact with a rigid trolley along one girder to provide current for the solenoid switch that trips the gravity-type door. Consequently, the car can be dumped at any time after the shoe comes in contact with the trolley, which enables the operator to use the entire discharge end for dumping space. The machine is diesel-powered, with a generating system to provide current for the lighting and dumping circuits necessary in operation.

An investigation of the production and cost records of this machine was made, after which it was dismantled and shipped from its last levee job to the coal fields of southern Indiana. During its operation at the Enos Coal Mining Co. the bridge was obliged to travel on mats, because the caterpillar-bearing area was not great enough to support the 280-ton load on the soft surface. A Bucyrus-Monighan 5-W walking dragline with a 6-yd. bucket on a 100-ft. boom was used as the excavating unit, and in some places it was necessary to use mats under the tub of this machine.

A total reach of 150 ft. with the dragline and 350 ft. with the bridge made it possible to transport the dirt a total distance of 500 ft. This was not necessary, however, since the dragline could easily separate the top soil for building a levee behind which the mud could be dumped. Working in this manner, the combination unit opened up a box cut 200 ft. wide down to the rock, which had to be blasted before it could be handled by the shovel. The 750-B stripping shovel then came through and opened up the box cut to the coal next to the

drainage ditch, piling the rock spoil in the bottom of the remainder of the dragline cut.

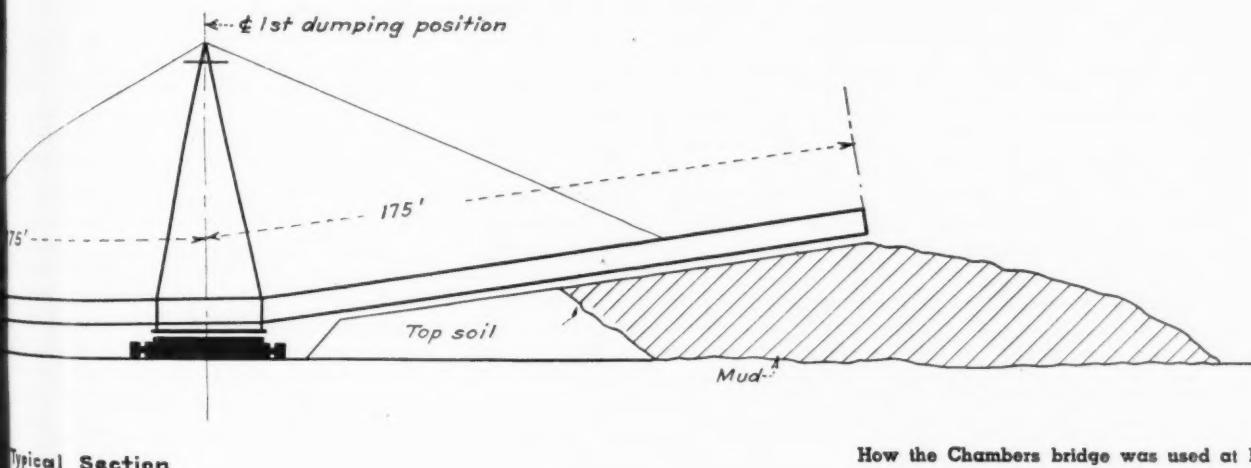
Since the Chambers Bridge was the only machine of its kind, and had not worked for several months, we were fortunate in being able to employ experienced operators. These men helped dismantle and reerect the machine, and when ready for operation no time was lost in breaking in operators. This proved to be of considerable advantage because efficient operation of the combination depended largely on the ability of the bridge runner to perform his work with a minimum of lost time. With the 5-W dragline using a 6-yd. bucket the combination produced 300 cu.yd. per hour of operating time. A mechanical counting device in the engine room enabled each operator to report the number of trips made on his shift.

Numerous time studies of the bridge operation show the following breakdown of the operating cycle:

Element	Minutes	Percent
Loading	0.113	11.7
Travel loaded	0.482	49.8
Dumping	0.133	13.7
Travel empty	0.240	24.8
Total cycle	0.968	100.0

In three of these elements particularly—loading, dumping and travel empty—the skill of the operator is of great importance; these three comprise a little over one-half of the total cycle time. The fourth element—travel loaded—is considerably affected by the angle of the discharge boom.

The machine was installed to perform a special task, and this it did in a very creditable manner. There has been some discussion of attempting to reconstruct the bridge into an auxiliary unit for the removal of high overburden, but at present this idea has not passed the discussion stage.



How the Chambers bridge was used at Enos in disposing mud away from the box cut.

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COAL AGE

POWER SHORTCUTS

To Meet Wartime Production Goals

Fan or Water Cooling May Permit Transformers and Motors to Handle Extra Power Demands—Unusual Transformer Connections Provide Possible Way Out—Off-Standard Transformers and Motors Provide Spares

WARTIME CONDITIONS require the use of every available transformer and motor and may force them to carry maximum safe loading. While voltages and ratings usually are fixed, and are specified on the nameplates, there are many tricks that may be resorted to for mating unmatched machines and for taking care of overloads with comparative safety.

There will yet arise many emergencies that some undersize, discarded, obsolete or odd-voltage transformer or motor can be made to meet. When a mining man is put on the spot, he takes a little time to think it out. He shouldn't give up until he has considered odd transformer hook-ups, a shift in motor connections, artificial cooling or all three.

One of the newest ideas in boosting transformer ratings is forced circulation of oil and cooling it with a fan, as in an automobile engine. The necessary accessories now are being made available to apply to existing transformer banks. Increases of 20 to 60 percent in output per unit of weight are claimed.

Some engineers believe this will become standard practice in the years following the war. Years ago a prominent manufacturer discovered that small jets of compressed air impinging on transformer radiators broke up the hot film of air, accelerated cooling and increased capacity. In an emergency, one mine cooled a bank of small transformers in a vat of water.

There is nothing new about the fan-cooling of motors. It is common practice to blow intermittently rated traction motors and convert them to practically continuous rating. That principle is equally applicable to stationary motors. Temperature is one of the important limiting factors in rating the output of a motor or a transformer.

There is need to use more care to select motors of correct rating for the job. Besides being less efficient, oversized a.c. motors result in poor power



Transformers lend themselves to a variety of wartime connections.

factor, which is reflected all the way back to the generator, producing excess heat and a waste of power. It is not necessary and not patriotic to buy oversized motors.

Most modern a.c. motors in the low-voltage class are wound for 220/440 volts. The change can be made in minutes with a screw driver and a piece of tape. Some older motors are not so arranged, but most of them may be reconnected in the shop. When such change is made, a suitable starter must be installed so that the motor may have proper protection. Even a two-phase motor may be operated from a three-phase power supply by using two transformers "T" connected on the high-voltage side.

When dealing with three-phase power, the use of three single-phase transformers offers a variety of possibilities in voltages and in connections that may save many a shutdown. As an example, suppose three 2,300- to 115/230-volt transformers are available to drive a 440-volt motor. A delta "Y" connection, using the 230-volt taps, will give 400 volts for the motor. That, being within 10 percent of rated voltage, is permissible. If the primary voltage happened to be 2,400, the result would be 416 volts for the motor.

Here is a connection used to keep maximum secondary voltage low and provide standard 120-volt current for lighting on the same circuit: The transformers, 2,400 to 120 volts, are connected "Y" on the low side. This provides 120 volts for lighting from any phase wire to neutral, and 208 volts, three-phase, from phase wires for motors. This is satisfactory for 220-volt three-phase motors.

All standard distribution transformers are rated for full load on any primary voltage 2,200 to 2,400, secondary voltages (ordinarily 10 to 1 ratio) being in proportion. There is available, and usually carried in stock, a line of 9-to-1 ratio transformers at standard prices that would give, for example, 2,200 to 244 volts. These, with "Y"-connected secondaries, would provide three-phase 423-volt power from a 2,200-volt primary—O.K. for a 440-volt motor.

Standard transformers have a middle tap on the low side. Thus, both 220- and 440-volt three-phase power may be taken from the same bank of delta- or open-delta-connected units.

Twenty-five cycle transformers may be used on 60-cycle circuits at full capacity. Since there are many 25-cycle transformers in existence, this may offer someone a real opportunity.

TRANSFORMER CONNECTIONS

Primary	Secondary	Phase	Capacity	Remarks
DELTA—2,200 v.	DELTA—220 or 440 v.	3	100%	Standard arrangement
DELTA—2,200 v.	DELTA—110 and 220 v. 220 and 440 v.	3	100%	Used where all motors cannot be reduced to one voltage; transformer coils are equally loaded.
OPEN DELTA—2,200 v.	OPEN DELTA—220 or 440 v.	3	86%	Usually temporary when one transformer has failed; in that case capacity is but 58% of original bank.
OPEN DELTA—2,200 v.	OPEN DELTA—110 and 220 v. 220 and 440 v.	3	43 and 86%	Open delta has dual voltage possibilities but only 29% original capacity at lower voltage; transformer coils not equally loaded.
DELTA—2,400 v.	4-WIRE "Y"—120 or 208 v.	1 3	100%	For combination light and power.
"T"—2,200 v.	4-WIRE—220 or 440 v.	3 to 2 phase		A temporary scheme with two transformers "T" connected on high side; operates 2-phase motor from 3-phase power; secondary voltage not standard.
DELTA—33,000 v.	4-WIRE GROUNDED "Y"—4,000 v.	3	100%	Standard for strip mines; adopted by some large shaft mines for primary power; large saving in cables over 2,300-volt primary.
4-WIRE GROUNDED "Y"—4,000 v.	DELTA—440 v.	3	100%	Customary connection for strip mine washeries; 220-volt power sometimes taken from same transformers as above.
SINGLE-PHASE AUTO—220 v.	110 v.	1	100%	Auto-transformer; used to reduce or increase voltage; take lighting from 220-volt line, or connect fractional hp. motor; other uses.

Possible ways in which transformers may be hooked up to secure various voltages are shown in the above chart, along with application and capacity data.

LIFE PROLONGED

By Proper Care of Electrical Tools

Proper Maintenance of Portable Electrical Tools Just as Necessary as With Larger Equipment—Involves Voltage, Motor and Mechanical Parts, Lubrication and Correct Use—Grounding Essential

By P. C. ZIEMKE
Milwaukee, Wis.

QUALITY and long life were built into practically all portable electric tools. To obtain the benefit of the engineering skill represented in the device by virtue of its sturdy construction and powerful motor, all in a small package, the owner must exercise painstaking care in both operating and maintaining it.

The old adage "an ounce of prevention is better than a pound of cure" never was more true than in this instance, where a little judicious care will pay well in a longer, more useful life for the unit and with less cost for parts or labor. Most portable tools have motors built to run on either a.c. or d.c. They will operate quite satisfactorily on voltages 10 percent over or under the voltage specified on the nameplate, but this does not mean that a 110-volt universal motor will function on 220 volts and last long. In this connection it must be mentioned that bench grinders are not equipped with universal motors. Operating such units with improper voltage or type of current can be most disastrous.

Checking Motor Failure—Is the circuit alive? Are the receptacles or outlets, as well as the attachment plugs, in good order? Look for loose binding screws, bent prongs and broken wires. Is the cord in a good state of repair? Are the brushes making contact with the commutator and is the commutator clean and perfectly round? Is the inbuilt switch in good working order?

Brush Maintenance—Commutator brushes are simple little devices yet they are responsible for fully 75 percent of the troubles encountered in maintaining portable electric tools. Usually the brushes are concealed under protective shields and therefore

escape the little attention that ordinarily would keep them in good working order. Periodic inspection at frequent intervals is the answer. Keep the oil and grease wiped out. Check on the tension exerted by the springs. See that the "pigtails," or shunts, are properly connected to their respective screws so that the heavy currents will not injure the springs by heating them.

Brushes that fail to make proper contact because of poor spring tension or improper seating will soon ruin the commutator as a result of arcing. Just any type of brush material will not do to make replacements. The manufacturer spent much time in determining the exact degree of hardness or the quantity of graphite needed to provide ideal commutation. Therefore, unless you can match the old brush stock closely it is best to purchase replacements from the manufacturer. Oil and grease that get into the brush rigging will become carbonized and will freeze the brushes to their guides. Careful scraping or sandpapering will easily correct the condition. Never use emery cloth to smooth commutators or dress down brushes. The fine particles of emery are electrical conductors and will cause short circuits by bridging across commutator segments and other equally vulnerable parts.

Lubrication—The life and service of electric tools are more dependent on good lubrication than any other factor entering into the maintenance problem. All too many tools are purchased and placed in service with never a thought being given to lubrication. The oil and grease injected into the tool in the factory will, at best, last only a relatively short time. After that period the owner must see to periodical cleaning and lubrication to insure continued service.

It is true that some manufacturers sell a line of permanently lubricated

tools that are claimed to require no attention by the owner for the life of the machine. However, unless one is sure of the integrity of the manufacturer and the interpretation of the claim of "permanent lubrication" it is smart to investigate.

Tools that have been retired from service for an extended period should be disassembled and cleaned to insure freeing the vital bearing surfaces of any congealed oil or grease rendered useless through oxidization. The same holds true for any tool taken in for checking or repairs. Clean all the parts by immersing them in gasoline, kerosene or some other solvent to free them of all dirt and old lubricant. The use of a jet of compressed air will greatly facilitate getting all the grime out of obscure corners.

When reassembling, don't make the common mistake of overgreasing. Fill the gear case no more than half full of the proper brand of grease. Grease expands when heated by the motor in service and, unless the gear case provides room for expansion, lubricant is forced into the brush rigging or into the windings, where much damage may result. Place the repaired units on test in the shop before approving them for service. Any misalignment of parts in reassembly will soon become evident through heating of the affected area and can then be corrected before damage is suffered on the job.

Drill Chucks—By far the vast majority of electrical tools are equipped with the well-known Jacobs chuck. These chucks are precision products and designed to last the life of the tool if properly handled. They require but little attention other than keeping them free of grit or steel cuttings that may cause the closely fitted parts to bind. Below is a list of do's and don'ts for getting the best service from chucks.

Use the correct size of chuck key to



Small but important facts in efficient production, electric tools repay careful use and good maintenance with long life.

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change drills. Never use a pipe wrench, chisel, hammer or screw driver as a substitute for the chuck wrench. Keep a few spare keys on hand. Some models have a small recess in the D handle in which to store the key. Where this is lacking use a 2-ft. piece of rawhide lacing or stout cord to fasten the key to the machine. Don't use chain if the drill is to be used about live electrical circuits. You may experience serious fireworks and personal injury.

Don't use drifts, pins, spikes or nails in the ventilating holes to lock the shaft when loosening or tightening the chuck. This will invariably wreck the fan blades in time since these are cast of white metal or aluminum and are not designed to withstand such abuse. In this connection it may be mentioned that many fan failures not otherwise chargeable to "spiking" practices can be traced to operating tools on voltages higher than the nameplate indicates. The centrifugal forces set up in the fan tend to promote metal fatigue and breakage finally results.

Units having keyless chucks can be manipulated by using the gear locking pin provided. Other models employ a locking collar which must be held rigid while the forward knurled collar is rotated. With both of these much damage can result from the use of pipe wrenches or other improper tools. Many chucks have been ruined by persons who failed to note the arrow indicating the proper direction of rotation.

When a chuck fails, check the information booklet furnished with the machine for instructions on how to remove it. Not all chucks are mounted by a pressure fit over a tapered shaft. Some of them are screwed on. A casual examination will not always reveal the method of attachment.

page of the heart or lungs or both, and the heating effect of the current, which may cause severe burns, chiefly where the current enters or leaves the body.

The extent of injury suffered by the victim is determined by three factors—the course the current takes through the body, the amount of current passing, and the length of time the victim is in contact. The quantity of current flowing is governed by two factors—the voltage and the resistance of the circuit, including that of the body. The capacity of the wire—that is, its ability to convey large quantities of current—has no bearing, with this exception: that sufficient current to cause injury must be available. It is highly important that everyone be informed of the fact that the comparatively small quantity of 1 amp. or less may kill. All ordinary circuits have sufficient capacity to kill. The potential hazard of an 8,000- to 10,000-amp. circuit therefore is no greater than that of the standard 110- to 125-volt lighting circuit commonly used for lighting and appliance service.

The usual wooden floor, if clean and dry and free of metallic cuttings or filings, is, on the average, a fair insulator. In fact, in most instances one can grasp a live part carrying a potential up to 220 volts without experiencing a tingle. However, there always is the possibility that the floor may be damp from underneath, that nails or spikes may pierce the wood to make contact with grounded earth or metal. Dry clothing has high insulating value but is rendered useless for that purpose when damp with perspiration or water. The larger the area of wet clothing one presents to a conducting surface, such as a tank or boiler, the greater becomes the hazard from shock, for if the bodily resistance is reduced below 250 ohms, accidental contact with even the lowly signal circuit of 50 volts or less may be fatal.

It is recommended that electric drills be provided with three-conductor cords, each wire carrying an identifying color to enable the wireman to keep his polarities straight. Usually a green wire will represent the ground wire, a red or a black one the "hot" wire or feeder, with the white one neutral. Next, all the convenience outlets should be provided with three-wire receptacles and the cord ends fitted with three-wire attachment plugs.

Where wiring is in metallic conduit a reliable ground is secured by bolting a short wire to this conduit box and to one leg of the three-wire outlet. Where the wiring is of the open type,

or knob and tube construction, either a third wire may be provided to furnish adequate grounding or one side or leg of the two-wire circuit must be grounded at some point in the system and this wire in turn connected to polarized outlets. Such measures insure having a ground for any electrical device.

Extension Cables—In a great many instances the work is located at some point beyond the reach of the ordinary cord furnished with the electrical drill. In such cases it is recommended that heavy-duty service cord of a size sufficiently large to prevent voltage drop, heating and decreased efficiency of the tool be used. Unless such extension cords are properly stored when idle and given periodic inspections for bad cuts, scuffed spots and mutilated plugs on body connectors, trouble may be expected at some moment when delays may prove extremely costly. Remember, rubber and copper both are very scarce these days.

The installation of long lines to supply power outlets and the use of small wire in their construction, plus an overloaded condition, may easily reduce the effective voltage and cause poor tool performance. The solution lies in rebuilding the line with larger-sized wire, installation of supplementary lines to divide the existing load or installation of one or several of the new dry-type transformers that lend themselves so well to crowded conditions where the bulk and fire hazard of oil-cooled transformers prohibits their use. Recommended extension-cord sizes are given in the accompanying table.

Safety Switches, Screw Feeds—Accident records prove that many serious—and avoidable—injuries have occurred to workmen using tools equipped with positive or snap switches. Safety-minded purchasers insist on the safety, or "deadman's," switch, since, in using them, the machine is connected to a source of power only as long as the trigger remains depressed by the operator's finger. Thus when the drill encounters its greatest load, at the moment of breaking through the stock, it tends to twist out of the operator's control with considerable violence. Failure to shut off power instantly under such conditions may prove disastrous for the workman and the tool.

Where larger than $\frac{1}{2}$ -in. holes are drilled in heavy stock it becomes necessary to use an "old man" to increase feed pressure and spare the workman physical fatigue. While the use of an "old man" to back up a drill is, of itself, not to be condemned if the tool is designed with a screw feed for proper centering and load distribution, it is a practice that is highly destructive to tool life where the screw-feed facility is lacking. In practically all the smaller models having no screw feed the placing of much pressure on the spade handle, which usually is well off center, causes misaligned holes and possible drill breakage, and in other models direct pressure by means of boards or 2x4's on the motor end will cause it to crush in and injure the internal mechanism.

Drill Sizes, Tool Speeds—It is common knowledge that the smaller drills require relatively higher speeds for successful operation. Listed here

are the tool manufacturers' accepted standards for electric drills:

$\frac{1}{4}$ -in. size, 1800 r.p.m.
 $\frac{3}{8}$ -in. size, 900 r.p.m.
 $\frac{1}{2}$ -in. size, 450 r.p.m.

Many purchasers of electric drills make the mistake of buying a unit that later proves to be much too small for their use. Usually the result is that mechanics using the device are inclined to take the larger drills, which cannot be accommodated by the small chuck, to an emery wheel to dress the shanks down until they fit the chuck. Such grinding, first of all, can never be done accurately outside of a properly equipped tool room. The result is that the drill wobbles, the hole is drilled off-size and often out of line, and the drill is practically ruined for use in the proper sized chuck at some later date. And—by far most important—using such mutilated bits in electric drills not designed for such sizes will result in undue strain on the unit and greatly shorten its life.

It is the writer's experience that in the vast majority of the medium-sized plants it is considered a mark of economical management to purchase a bare minimum of electrically operated tools for the use of the construction and maintenance forces. While, on the face of it, this looks like good planning, it may, upon investigation, prove to be just the contrary. On paper the plan to purchase portable equipment and justify its expense by keeping it in circulation among all trades looks promising since it would appear that in all probability the equipment would thereby be in constant use and only occasionally a mechanic might have to wait his turn to use it. In practice it is all too frequently true that since no particular individual is specifically charged with the maintenance and general responsibility for portable equipment it develops that "Nobody's responsibility also is nobody's concern." As a result high-priced machinery is outrageously abused and destined for an early trip to the scrap heap.

Experience has proved that the best plan is to have the electric tools charged to the head of some department, preferably the chief electrician, in most plants. Other department heads must then obtain use of the tool desired by requisition and are thereby held responsible for its proper care and safe return. This eliminates the endless search for needed tools when an emergency requires their immediate use and places the responsibility for careless handling squarely at the door of the proper party.

Recommended Sizes for Extension Cords

The following figures are based on current requirements equivalent to 150 percent of the full load amperage of the tool and a loss of approximately 5 volts. The values given are for 110-volt service. If the voltage is 220, employ a wire size corresponding to an extension length of one half the estimated length.

Nameplate Rating.....	0— 2.00	2.10— 3.40	3.50— 5.00	5.10— 7.00	7.10— 12.0	12.1— 16.0
Length, one side, ft.						
25.....	18	18	18	18	16	14
50.....	18	18	18	16	14	12
75.....	18	18	16	14	12	10
100.....	18	16	14	12	10	8
200.....	16	14	12	10	8	6
300.....	14	12	10	8	6	4
400.....	12	10	8	6	4	4
500.....	12	10	8	6	4	2
600.....	10	8	6	4	2	2
800.....	10	8	6	4	2	1
1,000.....	8	6	4	2	1	0

PARTS SITUATION

Necessitates Ordering Year in Advance

Manufacturing Space, Materials and Manpower Limit Parts Production, While Equipment Is Used Harder—Forecasting Parts Needs a Year in Advance and Ordering Accordingly Essential for Efficiency



Increased difficulty in obtaining parts necessitates forecasting requirements and ordering accordingly to prevent production interruptions.

By W. J. WALKER

Transportation Divisions
General Electric Co.
Schenectady, N. Y.

IT'S ALREADY painfully evident that renewal parts will become more and more the limiting item in maintenance programs. Renewal parts must be made available if badly needed transportation equipment is to be kept in service. To date, operators have been able to keep most of their equipment running. They have scrimped, conserved and salvaged to stretch existing supplies as far as possible. Suppliers have pulled rabbits out of the hat, worked on the double, and sweated over government restrictions to get out badly needed parts on time.

Unfortunately, we aren't yet over

the hump; the worst is yet to come. The coming winter will be far more critical than the last. Not only is the supply of parts limited by manufacturing space and critical materials but equipment is getting older, is being worked harder, and will require more than normal maintenance. The demand for parts has already jumped alarmingly in the last few months. Manpower is critical and no appreciable volume of new equipment will be obtainable in time to ease the strain on the maintenance department. The only hope is to make more efficient distribution and use of what is available, and this includes manufacturing space and critical raw material as well as finished parts. This in turn calls for careful forecasting and timing of requirements a full year in advance and for the closest cooperation between the supplier and the

user. It will result in maximum benefit to both parties.

Manufacturing limitations necessitate planning a year in advance. As stated, manpower is scarce, raw material under wartime restrictions is difficult to obtain and manufacturing space is limited. Consequently the manufacturing cycle has been greatly lengthened. Moreover, as a protective measure, operators should order a year ahead. Under present governmental regulations, most orders for maintenance carry the same priority. Manufacturers must take them in order of placing. Consequently, the operator who waits until the last minute to order parts will have to wait his turn and runs the risk of having his equipment standing idle.

This yearly forecast must be accurate and detailed to give maximum results. To say, for example, that 30 sets of armature coils will be needed in 1944 isn't enough. The catalog number should be given. Some other operator may need 25 sets of the same coil. The entire 55 sets should be built in one lot instead of two, thus conserving manpower, time and manufacturing space. Multiply this example by the hundreds of operators and it means many more parts for more operators on time. The end result is the same as pooling inventories. Thus more critical raw material is released for use in other badly needed parts. Overordering is equally bad. This means that one operator has more than he needs, while someone else goes without that many parts because there won't be enough to go around.

Even though the parts are ordered a year in advance, deliveries aren't made until the parts are actually needed. This further cuts down total inventory, because each operator doesn't need to build up and retain a huge stock of his own. This puts critical material to work that otherwise would be lying idle in stock.

This arrangement has many advantages to the operator. He is assured

of a dependable supply of parts when he needs them without carrying a big inventory of his own. He simplifies his bookkeeping by ordering once a year and rechecks periodically. Our records show that many operators ordered the same part over and over again last year. Confusion over governmental restrictions of inventory may have precipitated frequent ordering. This practice makes needless paper work for both parties, jeopardizes the supply of parts and makes poor use of both available manpower and manufacturing space. It is entirely unnecessary because the ordering of parts a year in advance with quarterly deliveries complies fully with governmental regulations.

Another factor that may aggravate the parts demand in the coming year has been the sporadic buying during the last two years. For example, we analyzed brushholders for the last few years. Taking 1939 as a base, we found that sales were 1.19 in 1940, jumped to 2.12 in 1941 and dropped off to 1.38 in 1942. Buying to date indicates that 1943 will be 1.93. Other



W. J. WALKER

items fluctuated in a similar manner.

This would indicate that when loads increased in 1941, operators bought rather heavily to meet the increased demands and keep an ade-

quate stock of parts. In 1942, because of governmental restrictions, buying fell off and operators used up their existing stocks. They are now scratching the bottom of the bin and demand, of necessity, has jumped to keep equipment running.

Everyone is in the same boat, and combined demands will swamp existing manufacturing facilities. Many operators will have to do without badly needed parts during 1944 unless prompt planning and forecasting are undertaken now, so that orders can be placed far in advance. Several large operators have been ordering parts from us a year in advance for the last several years, and it has worked out very successfully.

We heartily recommend that every operator adopt this program for his property, no matter what the part may be. All suppliers have solemnly pledged every effort to keep badly needed equipment rolling. Help your supplies to help you and help yourself at the same time. Plan to inventory your requirements a year in advance beginning now.

Typical form used to forecast specific parts requirements based on past usage and anticipated demand.

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Fig 1—Foot-of-hill operation: Stripping the Mammoth Bed with a dragline having a 113-ft. boom located over the bottom of the basin and in the trough of the valley. A pool of water in the rear extended the casting radius for a while. The high-tension wires on the left made it necessary to work part of pit with undersize shovels.

DARKWATER CUTS COST

By Trucking None of Its Overburden

Lengthier Booms and Longer Bases Extend Casting Radii of Draglines, Evading Double Casting or Trucking of Overburden—Blast Each Rock Bed Only as Forcefully as Its Strength Demands

By R. DAWSON HALL
Engineering Editor, Coal Age

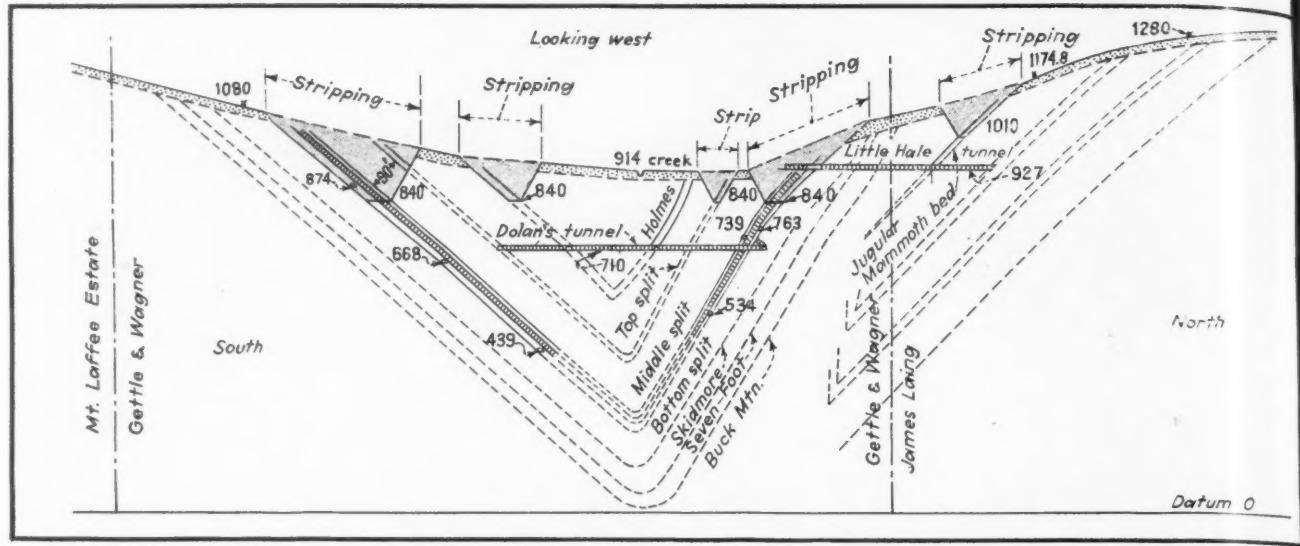
ALL THE OUTCROPS and overthrown measures of the anthracite region of Pennsylvania are now the scene of utmost activity because, with modern stripping equipment, the coal they contain is recoverable at minimum cost. Before the work has been completed to those economic limits of depth, width and distance which were conceived and determined when the

operation first was planned, changes in methods, equipment and explosives, especially equipment, already have made it possible to dig deeper and farther, and thus made it demonstrably unnecessary to abandon the operation of the stripping as soon as the objectives have been achieved.

"Deeper" and "wider" are watchwords of the stripper, which repeatedly have extended the life of an industry that seemed in earlier years, because of its narrow limitations, to be quite ephemeral. In fact, strippers in the

process of fulfilling the immediate restricted project often have introduced, before the planned operation was even well under way, mechanical equipment that was able to meet demands that greater depth and width would require. Anticipating such technical advances, they can afford to lay their plans to dig deeper and travel farther than their present equipment will permit, for greater permanence will warrant the employment of more elaborate and larger units.

As equipment has gained in size, it



frequently has been possible to convert an anthracite stripping from an operation involving burdensome and expensive railroad or truck carriage of overburden from pit to dump to a mere casting operation in which the spoil, in a single movement, is transferred either beyond outcrops and overthrows of coal seams or to land that had been made entirely devoid of coal by reason of meticulous mining and remining. This can be done despite the great depth of cover, the partial extraction of coal in the area to be stripped, the hardness of the rocks and many other deterrents.

An example of this tendency of stripping to undertake the recovery of coal not only from outcrops and overthrows but from the bottoms of shallow basins is furnished by the stripping operations conducted for the Reppier Coal Co., at Darkwater, about six miles north of Pottsville, Pa., by Schumacher & Shultz, where already partly mined coal of the Mammoth Bed is being stripped of the cover over all its three several splits right down to its basin and taken by trucks to the Reppier breaker nearby for preparation and for later distribution by Thorne, Neale & Co. In Fig. 2 is shown a cross-section of the coal seam about a mile from the present operations. However, it is typical of conditions at the part of the stripping now active.

The bottom split, from which most of the coal being mined comes, ranges from 8 to 22 ft. thick and pitches within the limits of the stripping from 40 to 80 deg. It has occasional slips which cause these variations in thickness. The bed has been mined in part by underground methods; in earlier years, breasts were driven from gangways up the pitch and these, at

depth, had their pillars removed. In shallow work, the pillars have been allowed to stand until they were stripped, possibly because the rooms they protected were driven before pillar drawing was customary and because, when it became a recognized practice, approach to them was difficult.

The first dragline used to lift the fragmented burden off this coal had an 80-ft. boom, so it was necessary to cast the overburden in two stages. Now, with a DL900 Pawling & Harnischfeger 3-cu.yd. dragline carrying a 113-ft. boom (see Figs. 1 and 3), the material need be handled only once as the excavator stands on a high berm and much of the material it discharges falls down the long slope of a big fill into a big pool in the rear. The rest of the spoil can be piled on the top of the berm. By making a full revolution at each dip, a bucket-swinging reach of about 236 ft. may be obtained, for the center of revolution of the excavators is not at the base of the boom. To that distance must be added the horizontal projection of the distance from the point of discharge to the bottom of the dump.

Thus, the material need be handled only once, greatly reducing expense. The pool described is part of the bed of Darkwater, a creek which, heading in Frackville and on its way down to the Schuylkill River, passes not far from the Reppier breaker. This furnishes an ideal spot for disposal of the spoil, and the strip pit itself, being near the breaker, in turn affords it a place for the disposal of refuse and an opportunity for replacing a road which the stripping operation has severed. Into another now abandoned section of the stripping, the silt from the breaker is being discharged, thus con-

serving the silt and protecting the Schuylkill River from pollution.

Unfortunately, the dragline in its operations is hampered by the presence of a 66,000-volt a.c. line which crosses the pit and creek at a right angle. For this reason, so lofty a unit cannot be used in that section of the stripping. Such coal as remains beneath these menacing wires and in the bottom split of the Mammoth is being loaded into trucks by two Bucyrus-Erie 43-B 2-cu.yd. straight-front shovels with 25-ft. booms and 18-ft. dipper sticks. The 3-cu.yd. P. & H. dragline already mentioned removes both overburden and coal and, when removing the latter, works partly in a pile of coal being placed by a P. & H. 2½-cu.yd. dragline which is extracting the few pillars still left between breasts in the bottom split of the Mammoth bed on the North dip of the basin. Another DL900 with a 3-cu.yd. bucket and an 80-ft. boom is removing overburden and coal from the 12-ft. top split of the Mammoth in a western section of the stripping (see Fig. 4).

Beneath the Mammoth bed are still the Skidmore and Buck Mountain beds, both 4 to 6 ft. thick, and these may be stripped later despite their armor of protecting pea conglomerates that will make excavation difficult. The basin here will be contracted and deep, for it has a sharp angular bend like the lower part of a capital V.

It will not anywhere be as easy as has been the present job, for the Mammoth has three splits which are thick not only in aggregate but even as severally considered. The top split was about 12 ft. thick and middle split about 8 ft. However, the Mammoth has two dividers, the upper one 4 or 5 ft. and the lower 8 ft. thick.

In the overthrow to the north, near

2—Cross-section of exposures from south to north striking west showing the Mammoth and Jugular basins. This is taken 6,000 ft. west of the Repllier breaker, whereas present operations are about 10 ft. therefrom.

3—Plan of foot-of-hill stripping showing location of principal stripping units.

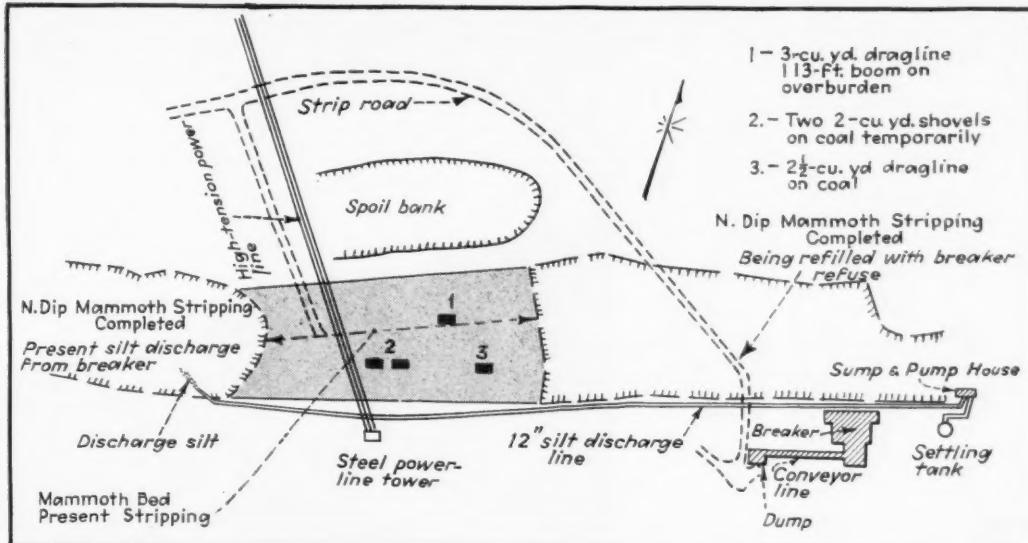


Fig. 4—Western operation: 3-cu.yd. dragline with 80-ft. boom loading Top Split coal in a truck of 18-ton capacity. The same dragline removes the overburden.

the brow of the hill, a 5-W Bucyrus-Monighan walking dragline with a 130-ft. boom and 5-cu.yd. bucket is at work (see Figs. 5, 6 and 7). This overthrow is part of what is known as the South dip (because the dip is toward the south) and is termed the Jugular, or Back Basin, because it forms a definite syncline, dipping south and tailing up like a basin but being cut off the true syncline by a width of barren rock (see Fig. 2). The dragline is located on a berm to the south of the excavation, which latter it has made to obtain access to the coal. To deposit the spoil across the other side of the berm, it makes almost a semicircular swing.

Coal also is removed by this dragline. Rock is being drilled by three Loomis gasoline rock drills. The overthrow has never been invaded by underground mining. A mile away to the west on the same property the same contractors are operating a Lima 1¾-cu.yd. gasoline-driven dragline, which is loading stripped coal.

At the Darkwater stripping, it is the practice to note carefully the levels at which certain types of rock are encountered and to "deck-load" the hole so that every part of it will have the required ballistic strength to fragment the rock. A blue-gray ground mass with whitish pebbles about the size of pea anthracite which occurs above the Mammoth bed forms an extremely hard conglomerate without any visible interstices. This zone is about 20 ft. thick. For the fragmentation of this material 60-percent gelatin dynamite is used (see Fig. 8).

There also is a reddish sandstone that is not so hard and is broken readily by 40-percent ammonia dynamite. Where the holes contain water, gelatin dynamite is used at the bottom of the

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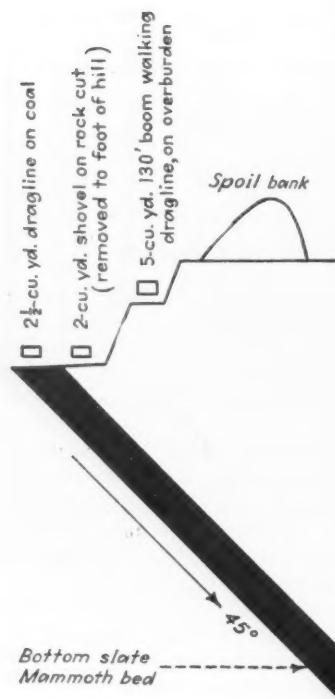


Fig. 5—Cross-section, top-of-hill operation.



Fig. 6—On top of the hill an overthrow of the Mammoth is being stripped by a walking dragline with 130-ft. boom. The slope on the left is the steeply pitching underclay of the coal measure already freed of its coal.

hole because of its waterproof qualities. Where the rock needs no fragmentation, stemming is used in place of explosive. Of course, the weaker material is creviced by the action of the explosive in the horizon of the stronger rock and so needs no other provision for its demolition. The weaker materials, also, are likely to be creviced already by mining, making an escape of explosive pressure possible and thus wasting precious ballistic energy.

The hole is drilled down to the coal or to the breast as the case may be. No harm is done to the anthracite when the explosive extends to it, whereas bituminous coal, in all probability, would be burned and pulverized by the explosion. Where the drill hole extends to a breast that is open for entrance it is customary to tie a heavy piece of wood to a piece of light rope lowered into the hole, thus holding it in place, under and across the hole. At Darkwater, however, this has not been possible, so in its place a straight pole 4 in. in diameter is dropped down the hole until it strikes the mine floor and a wad of paper is

put on top to hold up the explosive and prevent the force of the explosion from venting itself in the mine instead of on the rock in the hole.

Primacord is used for detonating the charges. This consists of penta-erythrite-tetra-nitrate, the explosive wave in which travels at a speed of about 20,350 ft. per second, almost 20 percent faster than in Cordeau, which formerly was used. It is suspended in the hole and, wherever it finds the explosive, it detonates it. If a blasting cap fails, it may go with the coal to market, but it is asserted that the Primacord will not fail and if it should, such a long length of it as is used could not fail to be detected and it is said to be insensitive to any shock other than that of a No. 6 or more powerful cap. The speed of detonation is said to increase the efficiency of an explosive charge.

Primacord is said to be economical, strong, light, easy to handle and moisture-resisting, although not absolutely moistureproof. The explosive in Primacord is covered with an asphalted textile covering. At Darkwater, the

product used has a reinforcement heavier than that in the "plain" product, but it does not have a wire binding such as most quarries prefer. The cord can be connected simply by tying it at right angles to the main lead by a half hitch. It is passed down one side of the hole, and the explosive is lowered alongside it. The rapidity with which the explosive wave carries is said to assure that no connection will be severed before the charges have all been detonated.

None of the holes are sprung, but all are well-stemmed with such material as is available, usually the material taken from the hole. At this operation, 6-in. drills are being used. In all, there are five drills, two being Loomis No. 48 diesel rigs. As a rule, the holes are shot by the experts of the companies furnishing the explosives. It is not customary to drill a large battery of holes, firing all or a few of them at one time, but to drill a few, loading them with explosives and discharging the latter promptly. With this arrangement there is less risk of distortion of nearby holes.



Fig. 7—Same dragline shown in Fig. 6 piling spoil on outer edge of berm. Three machines are drilling the overburden. One of the two long shoes on which the dragline travels when moving Mammoth bed from place can be seen below the cabin of the excavator.

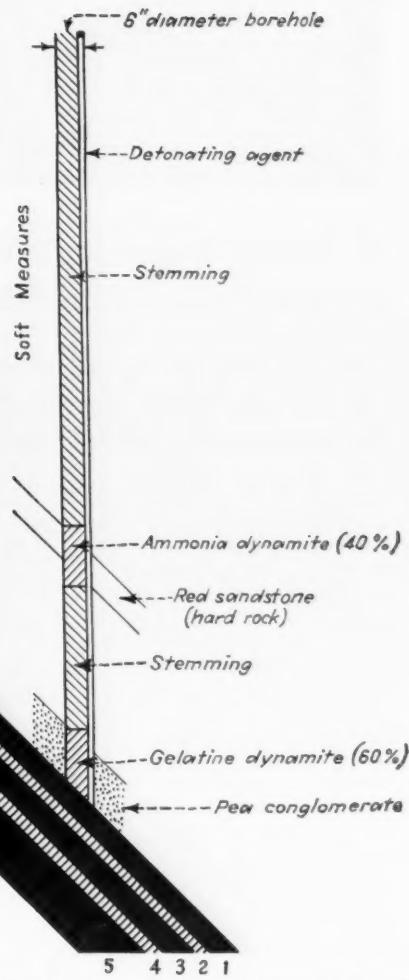


Fig. 8—Cross-section of bottom of borehole showing bed. charges of explosive and stemming.

In shooting over areas that have been mined there always is a possibility that the force of the explosion may escape into a crevice instead of expending its force in fragmentation. With so few shots fired at a time there is less fear that damage may be done to nearby mines. In many instances, where a large number of shots are fired at a time, the men in neighboring workings have to be withdrawn for fear of falls or fumes, but with the system pursued at Darkwater such risks are eliminated.

Deck-loading has been in operation at least since the early twenties in the southern anthracite region. It is natural to put the explosive just where the "brisance" (rending effect) is needed and not somewhere else where it may be wasted in making crevices in weaker rock, leaving the stronger rock unaffected. For a while, it was regarded as a trade secret. Those who had no experience found the conglomerate difficult to fracture. It was at one time, perhaps, a dangerous practice, for the separate shooting of charges in a hole is not conducive to safety. Primacord, which fires them

all at once with the same instrumentality, entirely overcomes that defect.

In the footwall of the overthrust there may be seen in dry weather the small crater-like evidences of what are termed "sulphur stones"—pyritic material that, contrary to the normal pyrite of the anthracite mines, decrepitates and turns a dirty white as in bituminous coal. This, quite a usual occurrence in the footwalls of Mammoth stripings, does not appear in the footwall of the North dip on the south side of the strip pit. On that dip, there are, it is true, even more crater holes which were made by the miners preparatory to placing their "legs" (posts) as they advanced their operations up the steep pitch.

Transportation is provided by twenty 8-cu.yd. Euclid trucks, each of which carries 13 tons of coal. Three of these have Cummings diesel engines and the other seventeen Waukesha gasoline engines. Recently have been added seven 10-cu.yd. Model F diesel-equipped rear-dump Euclids with Cummings diesel power, each handling 18.40 tons per load. These newer

Euclids have four 14.00 rear tires and two 12.00 front tires.

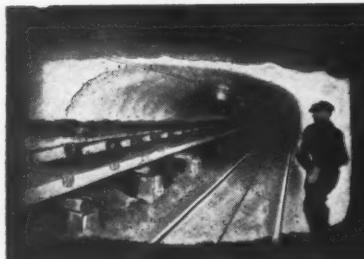
Omitting the one International bulldozer at Westwood colliery, Schumacher & Shultz are operating one International TD-18, one International TD-40 and an Allis-Chalmers LO tractor with bulldozers. These machines make and repair roads, help trucks that have difficulty in climbing steep gradients and shift both coal and overburden. As the roads at times get quite dusty, a station is provided where an attendant douses empty trucks with a heavy flow of water which dribbles on the roads and thus keeps the dust under some control.

The average output of the stripping, which operates three shifts every 24 hours, was 35,000 tons daily in June. A territory about three miles long and about 2,000 ft. wide is covered by the operations. B. H. Hay is general manager of the Replier Coal Co. J. E. Schumacher and H. H. Shultz Jr. are partners in the stripping firm of Schumacher & Shultz. John H. Morrison and Francis Flanagan are the strip-pit foremen.

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THE FOREMEN'S FORUM

A British Inspector's Viewpoint on the Way To Cut Toll of Shotfiring Accidents

Should Shots Be Placed in or Above Partings in Coal Seam?—Shoot Coal, Bottom and Top in Layers so Explosive Charge May Be Reduced—Short Holes Best if Flame Is Adequately Confined

SHOTS in a coal seam should be placed in or immediately above a hard band, if any such parting has to be broken, so that the strength of the explosive will be located just where the utmost energy is needed, declared Cyril Leigh, government inspector of mines, in an address before the South Wales Branch of the National Association of Coal Managers, at Neath, Glamorganshire, Wales.

[Placing shots where they will break down, fragment and mix incombustible matter with the coal, as suggested by the inspector, would seem likely to increase the percentage of impurity in the product. Many prefer to shoot down the coal below the parting and then place another charge at some higher point and thus shoot the parting down with the coal, in this manner causing minimum fragmentation.]

With Light Burden, Small Shots; With Small Shots, Greater Safety—In thick seams of coal, as also in heavy brushings of mine roof or heavy liftings of bottom, it generally is best to drill the holes at two separate levels, because in this way the shots are less burdened than when placed all at the same level. In thin seams, holes should be drilled closer together than in thick seams, so that the burden on each shot will be lighter; in consequence, the breakage will spread a shorter distance sidewise. Advantage always should be taken of the slips, especially if well defined. [The slips to which the author refers probably are pressure slips which are at an angle to the longwall face and are not natural but the outcome of mining; but the advice is good for all slips, natural or created.] Charges usually give best results when the holes into which they are placed have been driven at right angles to the slips. Boreholes should not be drilled too deep, and the burden on the hole should not be excessive.

Cushioned Blasting—The Explosives in Coal Mines Order stipulates that the clearance between hole and cartridge shall be not less than $\frac{1}{8}$ in. It is a much-discussed question whether a greater clearance than this is desirable. With more clearance,

the violence of the shot is cushioned. Regarding this, experimental work is proceeding, which work suggests the possibility that the efficiency said to be increased by cushioning is obtained at the expense of increasing the risk of setting fire to combustible gas. A way may be found, however, in which the efficiency may be increased without thus adding to the hazard.

How Much and How to Charge—Other suggestions made by Mr. Leigh were that: (1) There is a certain size of charge which if exceeded will cause an ignition if an ignitable percentage of gas is present; (2) the detonator should be at the outer end of the cartridge last placed in the shothole and should be directed at the charge; (3) with a shothole of any given diameter, the longer the hole, the less likely it is that the shot will ignite combustible gas; (4) a short shothole is dangerous.

Short or Long Holes

[Thus Mr. Leigh declares both for and against short shots, but what he probably desires is a shot with not too much burden, so that the explosive if near the charge limit will not fail to bring down that burden, and a hole long enough that it can be well stemmed so that the shot will not be likely to project burning gases into the mine air. The crevices being more developed near the face than in advance of it, the hole should be so long that the stemming will close off these more superficial crevices.

[Undercuts and shotholes in Great Britain are shorter than is customary here. The use of such short shots decreases output and probably increases the quantity of explosive used, for the stresses induced by the sheer weight of a projecting slab of undercut coal and by the greater leverage exerted by the pressure of the explosive gases in a long hole surely should aid in bringing down the coal and in protecting it from undue punishment.

[Regarding the advantages and disadvantages of long holes from the angles of safety, economy of explosive and size

of coal little has been published. Drilling a number of short holes in great haste, as it is alleged is the practice in Great Britain, does not seem the way to reduce accidents. The shorter and more numerous the shotholes, the more frenzied firing is likely to be customary, which, however, does not suggest that in the United States conditions are any better than, or indeed as good as, in the British Isles.]

Stemming and Firing the Shot—Mr. Leigh added: (5) The smaller the diameter of the heading, the smaller the charge that should be permitted, because methane is less likely to be ignited, if this fact is recognized. (6) The best stemming consists of an intimate mixture of three parts of sand to one of sticky clay with less than 10 percent of moisture, and no more than 20 percent of the sand should pass a 50-mesh screen and not over 15 percent should be held on a 5-mesh screen. (7) Brick dust or ground clinker can be used instead of sand. (8) The stemming should not break into small pieces even if dropped on a hard floor from a height of 4 ft. (9) Good stemming increases both safety and efficiency. (10) Coal may so burst or bump as to make a sound like that of the explosion of a charge and may thus mislead a man who has gone off to guard one of the many entrances leading to a place where the coal is being broken down. In consequence, hearing what he thinks is the shot, he may return too soon and be killed or injured.

If Blasting Machines Are Not Maintained You Will Have Misfires—(11) The E.C.M.O. demands that every "exploder" be examined once every three months, and in this test a low-tension unit should be able to fire a normal low-tension detonator despite the addition of a 15-ohm resistance to the circuit, and a normal high-tension detonator despite a shunt resistance of 300 ohms placed across the terminals of the blasting unit. (12) Gears of blasting machines must be kept clean and their bearings dry. (13) Dry battery blasting units provide a non-inductive source of current, hence more powerful currents can be taken from them than from magneto units.

Detonator and Cable Precautions—(14) Leads should be folded no more than is necessary. (15) On straightening leads, do not pull on the detonator but take a firm hold on them close to that cap. (16) It is cheaper as well as safer to use a good quality of cable and to renew it frequently, thus eliminating the waste of time, annoyance and danger of misfires.

Multiple Shooting—(17) Advantages

Aviation—A Progress Report

The Lessons of War Become the Key to a Richer Peace

TUNISIA, PANTELLERIA, SICILY—stepping stones to momentous events! But that is not all. For they spell out across the blue waters of the Mediterranean a pattern of invasion that has progressed far since last summer's first major Commando operation against the French coast.

From Dieppe, you remember, too many of the raiders never got back. But in Tunisia, and on through Sicily, the Allied might plowed inexorably forward, winning objective after objective at a surprisingly low cost in casualties. Air supremacy over the battlefield? Yes. But we have learned, too, how to save lives and shorten the war by strategic air bombardment as a prelude to invasion.

Thus the bombardment plane—rarely seen by the doughboys on the fighting fronts—is destined to save their lives by hundreds of thousands in the decisive attacks that are to come. This fact is confirmed by the cold calculations of the responsible strategists. It will give renewed courage and confidence to every member of the armed forces and of the home fronts throughout the United Nations.

For instance: thorough strategic bombardment of an objective reduces by nearly fifty per cent the surface forces required for invasion. Anticipated losses are reduced from more than fifty per cent of the original ground force to about twenty per cent. Precision bombardment—as used on railroad objectives in Rome—reduces this percentage of loss still further when it is followed by offensive action on the ground.

The inference is clear. Effective prosecution of the war will require smaller ground combat forces and much larger air forces than some of our strategists once thought.

Our most urgent need, then, is for ever-mounting fleets of aircraft. And, fortunately, this is just what we are getting. The American aircraft industry now is producing as many airplanes as all the rest of the world combined. In 1938 we made 100 planes a month. Now we make three times that many in a single working day. By the end of 1943, our production rate will be about 10,000 a month.

But at this stage of the war, types of planes are more important than mere numbers. In the early months the program was heavy, and properly so, with single-engine trainers. Then, as training planes accumulated, the emphasis shifted to heavier types. Now we are turning out multi-engined bombers at a rate that is the envy of

the entire world. Some months ago the President revealed that we were manufacturing 500 long-range bombers every month. The figure was conservative even then. And soon we shall be producing planes of this one type at a rate adequate to replace the normal losses of a fleet of at least 1000 American heavy bombers operating as continuously as the weather will permit.

A glimpse of the poundage production may help us still further to evaluate the miraculous achievements of the aviation industry as a whole. It was 89,000,000 in 1941 . . . 291,000,000 in 1942 . . . 911,000,000 in 1943 . . . and 1,417,000,000 in 1944

This is the fifteenth of a series of editorials appearing monthly in all McGraw-Hill publications, reaching more than one and one-half million readers. They are dedicated to the purpose of telling the part that each industry is playing in the war effort and of informing the public on the magnificent war-production accomplishments of America's industries.

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Advantages

— if we need it. There you have the magnificent record of the American aircraft manufacturing industry — a monument to the cooperation of industry, labor, government, and to all-out teamwork between the aviation industry and those other industries which have converted their facilities to the manufacture of airplanes.

What of our enemies and our Allies?

German production probably has flattened out at 2500 a month — with downward revision in immediate prospect. Japan may be able to produce as many as 1000 planes a month — until we get our new long-range super-bombers in sufficient numbers to whittle down that figure. Italy may be able to turn out her 500 a month — for a little longer. At best the maximum Axis monthly total is 4000.

Add to our monthly score of nearly 8000, a total of approximately 4000 for Britain, Canada and Russia, and the United Nations score comes to 12,000 monthly. There we have a three to one advantage for our side. And between our own rising production and the brilliant operations of our bomber commands we should soon boost the ratio well above that figure. Therein lies the certainty of continued and growing air superiority over all the far-flung battlefields.

The critics of American airplane quality have been silenced ever since the ratio of enemy combat losses to our own on bombardment missions surpassed four to one. In the Pacific where our heavily armed and armored planes are knocking off the desperately stripped racing craft of the Nipponese, enemy losses often run as high as eight to one or more. In the Mediterranean theater, where the Italians were abandoned by their Allies, the story is much the same. Only in the well-defended homeland of the Nazis do we sometimes drop below the average, but even in those rare instances the ratio is still well in our favor and the effectiveness of our bombardment is adding constantly to our margin.

* * *

Behind the production lines the battle of research and design still rages. In many a laboratory night-shift, on many a secret test field, new and terrible surprises for the enemy are in the making. Super-bombers, destined for Tokyo, have long since passed

out of the design stage and the Japanese may learn about them almost any day. New discoveries, designed to sow swift and silent devastation, are farther along than our enemies believe. No longer will fog or storm or night be permitted to fight on the side of our foes.

The men of science who are toiling to broaden the horizon of our knowledge stand today on the threshold of discoveries that have been sought for centuries. New reservoirs of power may soon exert a profound influence in many fields of technology and through them on our way of life.

Once the war is won these new discoveries will be translated into better living. No longer will countless thousands spend their lives within their own communities or countries. New efficiencies in transportation will bring world travel within the reach of many who once had to stay at home. New family vehicles will navigate the skyways as easily and safely as the highways. Already more than a dozen manufacturers of airplanes, ships, automobiles, and electrical equipment are designing, building, or flying rotary-winged aircraft such as the helicopter or autogyro to meet the needs of tomorrow's families. New and safer aircraft of the fixed-wing type are ready for production as soon as materials become available.

The quality that now makes each of our war planes worth so many of those built by our enemies will be translated into the sturdy reliability demanded by peacetime operation. The devices that seek out and find our enemies behind the veil of fog or darkness will, after the war, reduce weather hazards to the point where they will be no greater in the air than on the ground.

Science and industry will continue to do their jobs and do them well. But if the world is to be made a better place for men to live in, statesmanship must not fail to do its part.



President, McGraw-Hill Publishing Company, Inc.

... America's mines can depend on Exide Ironclad power



SAVE TO WIN WITH THESE SIMPLE RULES OF BATTERY CARE:

- 1 Keep adding approved water at regular intervals. Most local water is safe. Ask us if yours is safe.
- 2 Keep the top of the battery and battery container clean and dry at all times. This will assure maximum protection of the inner parts.
- 3 Keep the battery fully charged—but avoid excessive over-charge. A storage battery will last longer when charged at its proper voltage.
- 4 Record water additions, voltage, and gravity readings. Don't trust your memory. Write down a complete record of your battery's life history. Compare readings.

If you wish more detailed information, or have a special battery maintenance problem, don't hesitate to write to Exide. We want you to get the long-life built into every Exide Ironclad Battery. Ask for booklet Form 1982.

AMERICA depends on its mines and miners today. It's going to take top peak production to whip the Axis... but America's mines and miners have the "know-how" to do the job.

Using the most modern of equipment, our mines are producing the coal, ores, and minerals which today are America's lifeblood. Exide Ironclad Batteries are sharing the job, providing dependable sources of electric power for shuttle cars, electric locomotives, and trammers.

Exide Ironclads can handle this job, for they're designed to give a giant surge of power where it's needed the most. Their long life is a guarantee of economy and complete efficiency. When you buy an Exide Ironclad, you *buy to last...take care of your batteries and save to win.*

THE ELECTRIC STORAGE BATTERY CO., Philadelphia
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Exide
IRONCLAD
BATTERIES

BACK THE ATTACK WITH WAR
BONDS—LET'S OVER-SUBSCRIBE
THE 3rd WAR LOAN

of multiple shooting are (a) reduction in risk of igniting firedamp. Reports bearing on this type of explosion show that most of the ignitions which have occurred have been caused by firing second or later shots; (b) only one examination for firedamp is needed and that examination can be made when the atmosphere of the working place is uncontaminated by the smoke from earlier shots and when roof and coal are in safer condition both for examination and shot charging than after the first shot has been fired; (c) less risk from flying debris and (d) saving of time. Two obvious disadvantages are (a) risk of an undetected misfire and (b) possibility that roof and sides may be more greatly damaged by multiple shooting than by firing the shots one at a time. Shots should be fired when as few persons as possible are in the mine.

No Shotfiring in Welsh Steam-Coal Mines—Too many shots are fired in most mines, in the opinion of P. T. Jenkins, divisional inspector of mines, Swansea, Wales, who, in discussion argued that if there were less, both safety and health would be increased. In the eastern part of the coal field, where steam coal is produced, no shots are fired, though the coal is as difficult to blast as in the anthracite area, but in the eastern part of the field it is understood that shots cannot be fired, and the coal is worked accordingly. In the anthracite mines where it is known that the coal can be shot, holes are drilled, loaded and fired unnecessarily. Examination for breaks should be made as well as for firedamp. Several operating men agreed that the coal could be brought down with fewer shots.

Free Powder a Menace

Free Powder a Mistake—The custom of giving powder to workmen free, said J. Lewis, is a big mistake, as more powder is used than is safe or necessary. It is a great help to the shotfirer when the miner also judges how much explosive should be loaded in a hole. Sheathed explosives should be used wherever there is a sign of firedamp. Low-tension detonators, declared G. Robbins, are preferable to high-tension because they can be tested before they are taken underground. Gwilym Jenkins, government inspector of mines, said that when more cartridges than one are to be used in a hole, they should, as in France, be placed in a special sheath of cartridge paper to keep dirt from getting between them. Mr. Jenkins also would limit the number of shots a shotfirer might fire in a shift, basing that number on careful observation.

[In the Pocahontas region, a frill has been put around cartridges so as to locate them in the center of the drillhole and thus prevent the shot from damaging the coal with which it otherwise would come in contact. This frill has the advantage that if the hole is not free from coal or other dust it will not gather up enough dust that a wad of such dust will be interposed between adjacent cartridges, preventing or deadening detonation.]

"Water Infusion" of Shotholes—After infusing water into the coal [forcing water for some hours into drillholes under pressure of 25 to 50 lb. or more per square

inch] it was found that, for months on end, no shots need be fired, declared David Daniel. By adopting infusion to suppress dust, it was found that shotfiring incidentally had been reduced, added Dan Jones. In fact, in one mine so few charges have to be fired that 90 percent of them now can be shot off shift.

[Infusion is not new, even in the United States. Certain foreign experts induced the United States Coal & Coke Co. to introduce it at Gary, W. Va., under Col. Edward O'Toole's management. It proved a complete failure, as he indeed anticipated. The failure was due to its being applied to a coherent coal seam that had not been subjected to the stresses experienced at a longwall face under deep cover. Apparently infusion occurs only near the face. Ten or more feet back, the water hardly percolates at all and will not dislodge the coal. From the discussion, infusion does not aid much in the dislodgment of some small part of the coal in South Wales.]

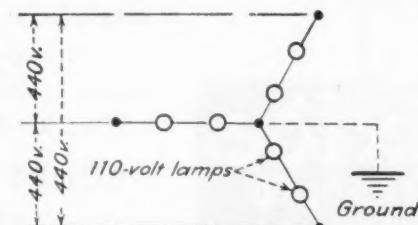
Three Simple Electrical Kinks Keep Coal on the Move

Scientific management has been defined as the easiest way to do a better job. It does not fall always to the coal operator to put such management into practice. Maintenance men and manufacturers have plenty of ideas that will help to keep the wheels turning. As time rolls on, they become more and more successful in forestalling misadventures that interfere with the flow of coal.

Three such simple means, coming from maintenance and manufacturing sources mentioned, may be suggested. They relate to lighting, elimination of fuses and the prevention of short circuits and have done much at one modern coal washery to reduce "time out."

The simple expedient of substituting 110-volt lamps for the original 220-volt type so greatly reduced lamp loss due to filament breakage as to cause the storekeeper to remark: "There is no comparison in the number of lamps used." The idea that miners will steal 110-volt lamps for use in their homes no longer receives credence at this mine. By and large, coal miners are at least as honest as anyone else. A traveling man who, when in town, always locks his car, for 25 years has never locked it around a coal mine and never missed as much as a cigarette.

Substitution of copper wire for fuses, because the correct size of fuse may happen not to be in stock, always has been a source of trouble and serious loss of time. At this washery, a three-pole 5,000-volt oil circuit breaker with overload trip protects the 1,500-kva. 4,000/440-volt



Six lamps signal if ground has occurred.

transformer bank. It is tripped by hand occasionally to see that it works. It has never caused a power interruption.

Each 440-volt motor, of which there are more than 100, is protected by an air circuit breaker in the control circuit. In more than seven years of operation only one of these small breakers failed. Motor protection has been perfect.

A simple ground detector made of such lamps and a few feet of wire gives warning should a ground occur at any point on the entire 440-volt wiring, motors and motor controls in the washery. Every indicated ground is run down and fixed at the end of the shift. Since its installation, all potential shorts have been removed before they could develop.

Safety Staff Makes Bigger Profit Than Operating

"Dollar for dollar and hour for hour, the time and money invested in accident seems to return an operating profit each year equal to, or greater than, the profit shown by the operating department itself, although this annual return usually is not discussed or anticipated," says a member of the American Society of Safety Engineers. He is discussing only the human side of the problem. A good safety man should save not only life but property; accidents to equipment often are more costly to a company than are those to lives and limbs. Many an accident results in no damage to employees but in a heavy loss to matériel. This is particularly true of mine accidents.

The equipment angle of the safety problem rarely is considered, the safety engineer not being engaged with that angle in view, but anyone viewing a mine after a wreck will realize that financially it is of paramount importance. A good foreman is the best kind of protection to a mine and he and the safety engineer should put their heads together to forestall accidents. They should collaborate rather than exhibit mutual distrust.

Pull Patient's Tongue Forward And See That It Stays There

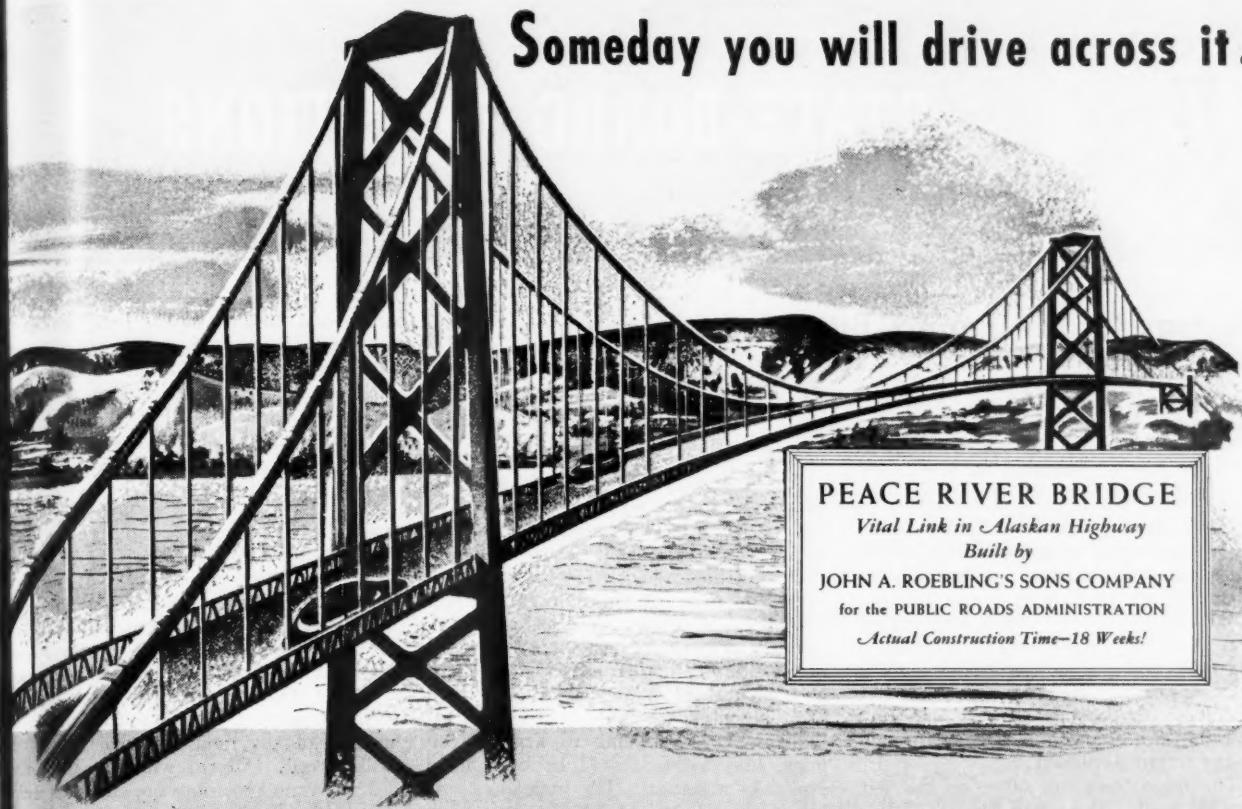
In *Coal Age*, March, 1942, p. 65, a question on resuscitation from electric shock was correctly answered except that one of the most important items in successful artificial respiration was omitted: namely, the pulling of the patient's tongue forward and keeping it there, a matter which my ten years' experience in first aid and my training extending over many years have led me to believe to be most imperative.

Records will show that many persons have died simply because their tongues have not been pulled forward so that the air can enter the lungs.

PETE HASCHAK
Portage, Pa.

[The editor stands corrected. As Mr. Haschak remarks, the pulling of the tongue forward is a necessary part of resuscitation. This applies to all kinds of suspended animation.]

Someday you will drive across it..



PEACE RIVER BRIDGE

Vital Link in Alaskan Highway

Built by

JOHN A. ROEBLING'S SONS COMPANY

for the PUBLIC ROADS ADMINISTRATION

Actual Construction Time—18 Weeks!

You're going to see the Yukon!

YOU BREAKFASTED in Dawson Creek, and now your car hums along the smooth Alaskan Highway, through the wide, pine-studded country of British Columbia. Around a curve, and suddenly, before you stretches the valley of the Peace River, spanned by one of man's most beautiful works . . . the suspension bridge. "Here's a bridge," you'll say to the family, "that helped to win the war."

You may stop a moment beside the bridge's approach, to tell them more about it. "That's a lot of river," you may say. "Two thousand feet wide, running 8 miles an hour! And here in the wilderness, a great bridge..."

"How ever did they get it here?" your wife asks, ever practical. "Well," you say, "they trucked it here,—100 freight car loads of material and equipment—not in balmy summer weather either. It was in the winter and spring of 1943. Bitter cold, snowing, blowing . . ." And before it reached Dawson Creek lay the urgent, anxious period of design, details, orders, priorities, manufacture and shipment, all compressed into the unbelievably short time of 18 weeks, an achievement made possible by the most complete co-operation between Roebling and the U. S. Public Roads Adminis-

stration with the timely assistance of the U. S. Engineers when special priorities were required.

"There wasn't much here when the men arrived. Roebling carpenters built weather-tight shacks for the men. Roebling men cut wood for Roebling cooks who kept their stoves heated red. Disease struck, and at one time eighty men were down. From Trenton, medicine was packed, and flown by plane..."

"Was the river frozen?" Johnny queries.

"It was frozen fifty-four inches thick, 4½ feet of ice. So they used the ice—built their construction tower on it. Because it was the fastest way. But they gambled, for they knew the ice would thaw. The break-up would come in March. Ice unsafe after March 15 and almost certain to be dangerous by April 1. That was the report.

"They raised one bridge tower, then skidded their 100-ton construction tower across the ice to raise the other one. Just like a sled. They had to hurry. But they won.

"After the break-up, the bridge towers stood safely pointing to the sky. They needed motorboats, but there were none. They built them. The 'John A. Roebling' and the 'Washington Roebling,' named for America's bridge-

building pioneers, helped the Army ferry as they worked to build the bridge. One operation followed another in rapid succession as Roebling, working hand in hand with P. R. A. field men maintained the tempo and rushed the bridge to completion."

"This bridge was so vital," you continue, "that as soon as the cables were spun across, they carried a gasoline pipe-line over on them. Trucks shuttled to one end of it, and from the other end toward the Alaska-based bombers and fighters—and Tokyo . . ."

You swing your car onto the bridge and purr along, a hundred feet above the swift Peace River. "They finished it in record time. In August, 1943 . . ."

"Surpassing their 100 year record as bridge builders, Roebling has done a magnificent job at Peace River," says Commissioner Thomas H. McDonald of U. S. Public Roads Administration. "Construction is complete...7½ months after the contract's signing . . . 18 weeks after the setting of the first piece of steel . . . cutting in half the best previous construction time!"

If you would like to read more of this Roebling saga, and own a color reproduction of the Peace River Bridge, write today. John A. Roebling's Sons Company, Trenton 2, New Jersey.



Bridge Builder...Pacemaker in Wire Products

JOHN A. ROEBLING'S SONS COMPANY

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STATE-BOARD QUESTIONS

Second Grade Penna. Bituminous Mine Foremen

Ventilation Problems

Q.—Show method of ventilating mine without doors and indicate all violations of the law as illustrated on map.

A.—Stable on right is in intake air, as required by law, but the air current used for its ventilation mixes with the air current used for ventilating another portion of the mine, whereas it should be conveyed directly to the return air current (Art. XV, Sec. 1) so that the air entering the mine will not be polluted by stable odors and, in the event of a fire, will not be filled with the products of such combustion. A heading should be cut through to the return as shown.

The mine foreman's office on the left is in the coal. The act of June 15, 1911, requires that all the buildings inside Pennsylvania coal mines shall be constructed of such incombustible material as shall have the approval in writing of the chief of the Department of Mines. Coal is a combusti-

ble, so an office constructed in the coal seam is not built of incombustible material unless it is lined with a sufficient thickness of material that will not burn.

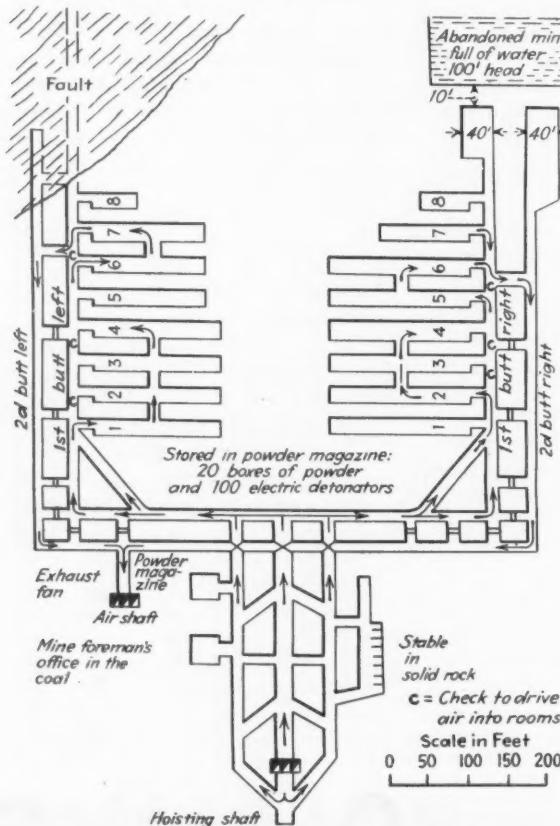
An underground powder magazine is shown near the mine foreman's office, but Art. 16, Sec. 1 declares that no powder or high explosive shall be stored in any mine and that no man can take into the mine any more of either than he needs for one shift and no one but a shotfirer can take into a mine any more than 5 lb. of powder or other explosive. Detonators also should be kept separate and apart from other explosives (Art. 16, Sec. 3). Perhaps they are being so kept in this mine, but neither should be kept in an explosives magazine. The inspection service of the United States Government is not unfavorable to underground storage.

One of the pillars in the main cross heading, that near the powder magazine, exceeds the 105-ft. limiting length. The two inclined roadways leading from the

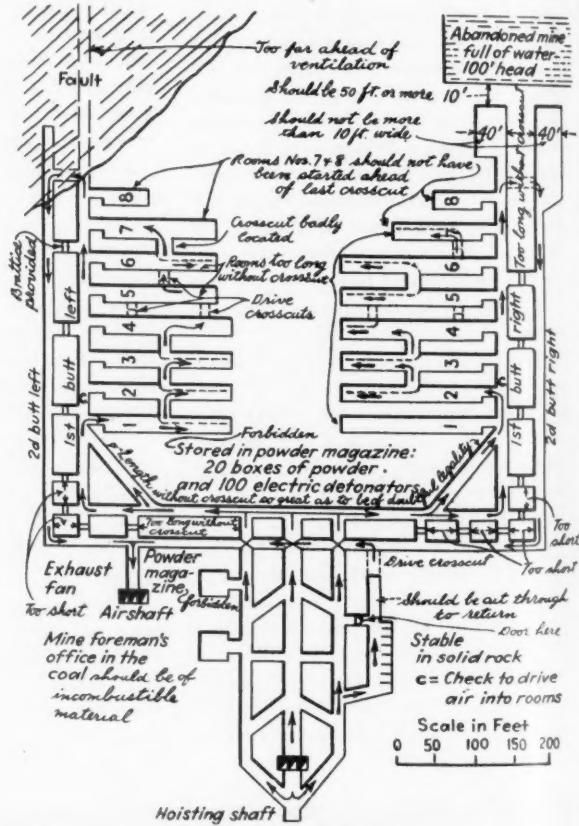
main cross heading to the First Butt Left and the First Butt Right are perhaps permissible legally, though one rib measurement in each exceeds 105 ft. and the other rib measure is just about of that length. Rooms 1 and 7 in the First Butt Right are too long to be driven without crosscuts; as also Room 5 in First Butt Left.

The First Butt Left is driven into the fault 200 ft. without a crosscut, and the First Butt Right and the Second Butt Right have been extended 212 ft. without means of ventilation, which is the more to be condemned because they have been driven more than full-room width apparently with the purpose of obtaining coal (see Art. IX, Sec. 3). Even if it be said that the roadway in the fault is not driven as part of any room-and-pillar system, it still exceeds 150 ft., which is the limit when certain provisions are complied with and some other system is in use.

Pillars where the butt entries break away from the main cross heading have been made too short, being less than 48 ft. Other pillars are short because they arise from the crossing of headings. That can-



In the operation of this mine many laws have been broken and many errors made.





TO THE FOUNDERS of our Company who, seventy-five years ago,
pioneered in bringing the manufacture of malleable iron to the midwest

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TO ALL OTHERS whose efforts . . friendship . . and patronage have contributed to our Company's leadership in the malleable iron and steel castings industry

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AND TO THE NATION in which it was possible to establish a record of seventy-five years of growth and continued success,

OUR THANKS AND GRATITUDE

NATIONAL MALLEABLE AND STEEL CASTINGS COMPANY

Henry F. Rose *Charles W. Clegg*
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General Offices: Cleveland, Ohio

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not be avoided, but, with care, chain pillars as measured in the direction in which the headings are driven can be made no less than 48 ft. long.

No provision in the law requires the staggering of crosscuts, but the location of these in a line involves (1) driving 105 ft. without crosscuts and then driving the crosscut also, with the hazard of 105 ft. and more of flimsy ventilation construction; (2) inefficiency in the use of power and the loss of ventilation due to the resistance of the air to traveling 210 ft. in narrow and rough passages in all the rooms at one time when they reach location calling for another crosscut and (3) the risk of roof breakage where crosscuts are set in line.

Rooms 7 and 8 off the First Butt Left and Rooms 6, 7 and 8 off the Second Butt Right are driven from points beyond an open crosscut, which is a violation of Art. IV, Sec. 2. The last crosscut should be kept open, thus compelling the air to go to that point. A new crosscut should be driven between the First and Second Butt Right and the present last crosscut

should be closed by a stopping, as shown.

The right butts have been driven too close to an abandoned mine that is full of water. Art. III, Sec. 5 requires that "the superintendent shall not permit the mining of coal within 50 ft. of any abandoned mine, or an abandoned portion of any mine, containing a dangerous accumulation of water, until said danger has been removed by driving a passageway to tap and drain off said water." The boundary pillar shall be at least 10 ft., plus 2 ft. wide for every foot, or part of a foot, thickness of the bed measured from roof to floor plus 5 ft for each 100 ft., or part of 100 ft., of cover over the bed at the boundary line. Art. IV, Sec. 17 requires that these headings, instead of being widened as in the illustration, shall be driven not over 10 ft. wide if driven to tap the water or gas.

Q.—What kind of stoppings must be built in crosscuts between main intake and return airways?

A.—Incombustible—Art. IX, Sec. 5.
(3 points)

Mine Foremen's Quiz, West Virginia[†]

The following questions have been selected from those included in "The Mine Foreman's Guide," used as the basis for examinations in West Virginia. The answers given in the guide, which normally are quite brief, have been supplemented by comments and data, which the editors of COAL AGE hope will be of assistance to those interested in these subjects. The numbers given the questions in the guide follow each in parentheses thus (Ventilation, 128, etc.).

Alternating Current

Q.—What is the advantage of alternating current? (Electricity, 1).

A.—Alternating current permits transmission at high voltages with little line loss and reduction to low voltages at the point of consumption.

[High-voltage direct current can be obtained by the use of two or more generators in series, and in transmitting electricity in this manner there would be, as with alternating current, little line loss. Such loss is proportional to the square of the current multiplied by the resistance. It is therefore desirable, if much electrical energy is desired, to transmit it at high voltage for energy equals voltage multiplied by current. By raising voltage you get the required energy with less current. Voltage doesn't clog the wires; current does.]

[It is safe and practicable to transmit direct current at such voltages, provided that the same precautions are taken as with alternating current, but the trouble is that we don't want to use such high-voltage current solely for the purpose of transmitting it. We want also to use it after transmission, and to do that we must

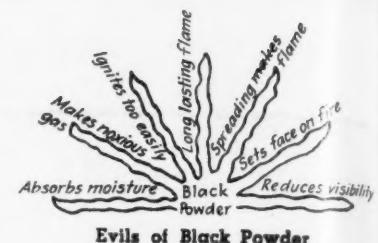
step it down to suit the motors of the machines we desire to drive. That can be done easily with alternating current. Only a transformer is necessary. With direct current, two or more motor-generators in series would be required to arrange the stepping down, and that would be impracticable.

[Because these motor-generators would not be insulated from the high-voltage lines, there would be danger also that, in working around them, a short circuit might cause the entire voltage to be thrown across the insulation of the motors and cause them to fail. High-voltage direct current may come into use when we find some simpler way of stepping down the voltage of direct current. Difficulties in stepping up and stepping down direct current make that current everywhere undesirable for long-distance transmission.

[Alternating current permits transmission at high voltages with little line loss, reduction to low voltages at the point of consumption and the use of induction and synchronous motors which, for many drives, are better suited than direct-current motors. As compared to the direct-current motor, the common induction motor (especially of the squirrel-cage type) is lighter, of more simple construction, costs less and requires less maintenance.]

Black Powder Hazards

Q.—What are the dangers accompanying use of black powder in coal mines? (Explosives, 10).



Evils of Black Powder

A.—Fires, premature explosions, gas and dust explosions and poisonous gases. [Black powder burns progressively and for a much longer time than detonating explosives, which decompose almost instantaneously. It is called a "deflagrating explosive," "deflating" being a \$10 word for "burning," but it is applied only to relatively fast burning material like gunpowder.

[As black powder burns instead of detonating, it often sets fire to the coal face. In some places where it is used fire chasers have to be employed to follow the shotfirers and put out the fires started by the black powder before they get too much headway. But in some mines there is less trouble of this sort, provided always that the burning of the explosive is completed before the shot finishes its work, for, if not, the shot may throw out incompletely burned powder and burning cartridge paper. Black powder takes moisture from the mine air, and so may get damp and then it will only burn, not explode, and do more damage than dry. It is especially dangerous if the charge is inadequate and fails to break down the coal, because then all the heat is held within the hole and may set fire to the coal.

[Black powder catches fire readily. It may be ignited by a spark when opening a keg of it. In making it into cartridge form it may be ignited by an open lamp. A stray current of electricity may ignite the cartridge when in the hole, and electricity from a mine locomotive may return through the car links and set fire to black powder when carried on mine cars. This is true of other explosives, but black powder is more susceptible than possibilities:

[Black blasting powder makes a long and lasting flame which will set fire to gas or coal dust, whereas a detonating explosive usually is out before it has time to ignite either. Especially is it dangerous if not provided with tamping, if inadequately tamped or not tamped with adequate materials. If it blows out of the holes or blows through a crevice in the coal or rock, the coal dust and gas are likely to be exploded. In burning, it makes carbon monoxide and hydrogen sulphide, both highly poisonous gases. Black powder makes much smoke, thus reducing visibility, making it difficult to inspect the roof and avoid collisions.]

FOUR SPEEDS OF BURNING

Name	Burning Speed
Detonation	Almost instantaneous
Deflagration	Somewhat slower
Combustion	Still slower

Materials Thus Burning

- High explosives.
- Dry black blasting powder and moist ammonium nitrate.
- All truly moist explosives, especially black blasting powder, when made with sodium nitrate.

[†] Continued from August, 1943, Coal Age, p. 92.

DESIGNED FOR THE JOB... ...BUILT FOR THE YEARS!"



THE STEEL I-BEAM HANDLE REINFORCEMENT

Adds extra strength above the socket where 65% of breaks occur.



* This brand on the handle means extra wear in the Shovel.

"BIG FIST" BRAND COAL SHOVELS, MADE ONLY BY WOOD, ARE ACKNOWLEDGED SHOVEL CHAMPIONS OF THE COAL MINES OF AMERICA.

● DESIGNED FOR THE JOB . . . "Big Fist" Coal Shovels are made to meet the exacting requirements of experienced coal miners.

BUILT FOR THE YEARS . . . "BigFist" Coal Shovels are made to out-wear and out-last ordinary Shovels.

THE WOOD SHOVEL

AND · TOOL · COMPANY · Piqua, Ohio

A NATIONAL ORGANIZATION

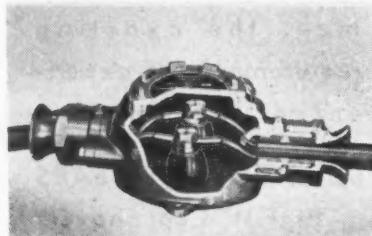
SPECIALIZING EXCLUSIVELY IN SHOVELS, SPADES AND SCOOPS

TIPS FROM MANUFACTURERS

Gas-Proof Splice Box

Ohio Brass Co., Mansfield, Ohio, announces the development of a new explosion-proof connection box, known as the O-B Type FG gas-proof splice box. Especially designed to sectionalize trailing cables in gaseous working areas, the device is said to offer a simple, durable means of connecting three-conductor cables by means of heavy bolted terminals. It has been tested and approved by the U. S. Bureau of Mines.

The splice box consists principally of bolted terminals on "Dirigo" spool insulators within a malleable iron case. The cable enters the case through a gas-proof packing gland which is assembled and sealed to the end of the cable itself.



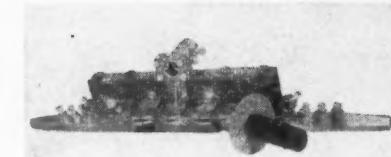
This assembly is done only once, preferably in the mine shop. Thereafter the gland assembly remains with the cable and is attached to the case by two cap-screws. Safety ground wire is soldered to the gland body and automatically makes the ground connection through the box casting. According to Ohio Brass, a safe, positive gas-proof splice is thus effected with this device by tightening only six capscrews, two on each gland and one each on the positive and negative connections.

The splice box is provided with two mounting lugs, permitting it to be spiked to a timber, keeping the cable off the bottom. Sizes are available handling three-conductor cables from No. 8 to No. 2/0.

Trolley Switch

Mosebach Electric & Supply Co., Pittsburgh, Pa., offers a reversible type trolley switch with center feed connection which, it is said, can be changed to either right or left hand by merely adjusting two bolts in the assembly. The incoming current can be directed to the right or left, or both directions simultaneously.

This new center-feed switch is supplied with two hangers for easy roof mounting and the center feed terminal lug comes in varied sizes to fit any feeder wire. The switch has a rubber handle and fiber guard



for added protection. Trolley wheels can pass through the switch when it is open or closed—the runners are equipped with a knife-edge approach to insure a smooth underrun.

Circular Cutting Tool

The rapid increase in timber construction of industrial buildings, aircraft hangars, mess halls, barracks and other structures essential to the war effort has been greatly accelerated by the use of bolted ring-connector joints. This type of joint increases the load carrying capacity of timber structures, prevents bending and shearing of the bolts which often results from wind-sway, vibration and "settling" of the structure.

Circo Tool Co., Milwaukee, Wis., is offering a tool for cutting the circular grooves for the rings or bearing plates. In preparing the timber for ring-connector joints, circular grooves are cut concentric with the bolt holes in the rabbeted overlapping ends of the timbers to be joined. The depth of the circular grooves is about half the width of the rings. Before the joint is assembled, the rings are inserted in the grooves on one of the joining timbers. Then, as the timbers are drawn together by tightening the through-bolts, the protruding rings in one face enter the grooves in the other face. The circular groove cutter is powered by a portable electric drill.

The split rings, of pressed steel, range from $2\frac{1}{2}$ to 6 in. in diameter. The circular groove cutter is made with either two

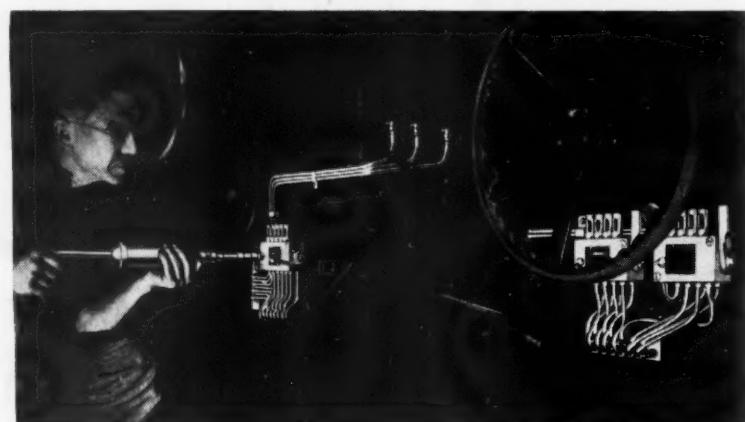


or four renewable blades. The cutter may be driven by a portable electric drill or drill press, or may be used in a hand-operated brace and bit. A different type of cutting head, with inside blades, is furnished to countersink bearing plates of the same diameter as the connector rings.

Bearing Lubrication

Positive lubrication of all bearings on machine tools and similar equipment, regardless of location or condition of bearings, can be had, it is said, through the improved "Multival" system made by the Farval Corp., Cleveland, Ohio. Oil or grease under pressure is delivered to the distributing blocks by a manual- or power-operated portable gun which serves as a central pump.

Complete "Multival" equipment consists of the multiple-valve blocks each





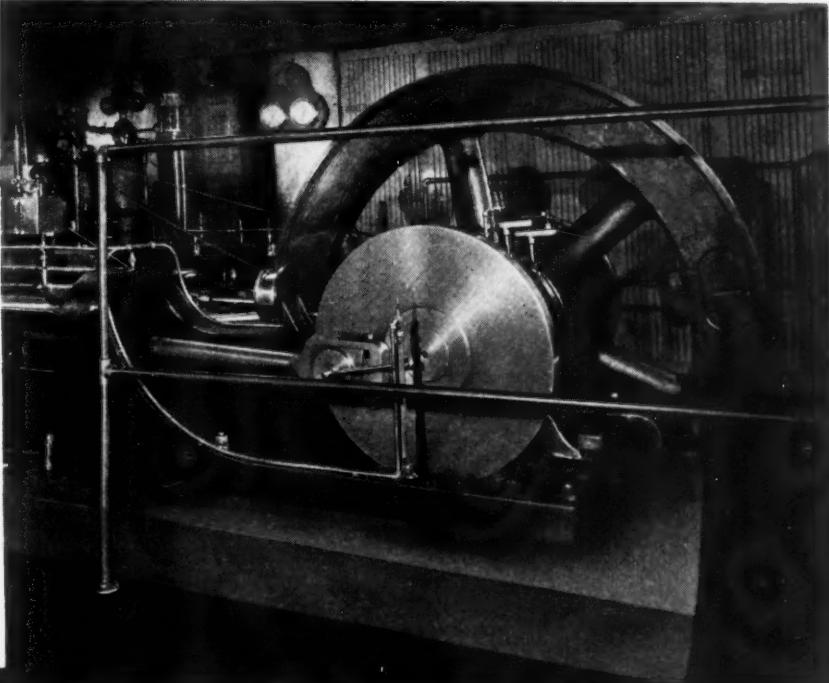
Official U. S. Navy Photograph

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DECISIVE POWER
demands utmost *plant* power.
For **STEAM** plant lubrication
that promotes full engine efficiency under all loads
use . . .



**...SINCLAIR STEAM
CYLINDER and VALVE**

OILS. They are suited to all engine designs and operating characteristics . . . give economical lubrication under the most difficult service conditions.

Write for "The Service Factor"—a free publication devoted to the solution of lubricating problems.

SINCLAIR INDUSTRIAL OILS

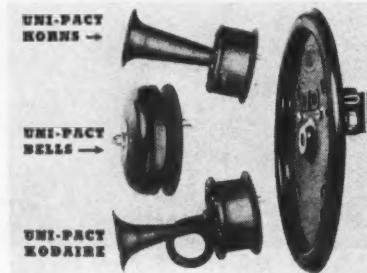
FOR FULL INFORMATION OR LUBRICATION COUNSEL WRITE SINCLAIR REFINING COMPANY (INC.), 630 FIFTH AVENUE, NEW YORK 20, N. Y.

serving two to ten bearings, lubricant lines leading to individual points, and suitable fittings to accommodate practically any type of bearing connection. The system can be readily installed by shop maintenance crews, it is stated.

Each measuring valve can be individually adjusted to deliver the exact quantity of lubricant required by the bearings it serves. A telltale on each valve piston indicates the positive delivery of lubricant to each bearing. With blocks mounted at accessible points on the machine, the operator lubricates all bearings with complete safety, it is said, while the equipment is in full operation—and not a bearing is missed.

Interchangeable Signals

A complete line of interchangeable signals, called "Uni-Pact," is being produced by Schwarze Electric Co., Adrian, Mich. This line includes heavy-duty bells of from 6- to 12-in. diameters, vibrating horns, and the Kodaire—an all-electric air-blast horn for high-power signaling.



These signals come complete with a dead-front adapter plate which fits any standard 4-in. square or octagon outlet box. Electrical connections are made only to terminals on the back of the adapter plate. The signal then simply "plugs-in" to the plate—turn center screw on bells, or two rim screws on horns, and mounting is complete.

Gas Mask

A new gas mask, the Protexall, offered by American-LaFrance-Foamite Corp., Elmira, N. Y., has the approval of the U. S. Bureau of Mines for respiratory protection against acid gases, organic vapors, ammonia, carbon monoxide and toxic smokes where there is sufficient oxygen present to support life.

The facepiece, of specially molded rubber, fits any face and forms a gas-tight seal. Large contoured lenses of shatter-proof safety glass give full-view vision. Dry incoming air passes over lenses, preventing fogging. Lenses are detachable. Head harness is comfortable and readily adjusted by swivel buckles. Buckles do not interfere with the wearing of firemen's helmets.

Exhalation valve is of simple design—no seat to corrode or get out of alignment, it is asserted. Valve is protected against injury by metal guard. The non-collapsible, strong yet light and flexible corrugated tube allows free head movement. Timer tells length of time mask

can be safely used. One revolution of dial hand means new canister is needed. Canister gives about two hours' service.

The canister is carefully designed to give a minimum of resistance to breath-



ing. It contains a low-resistance filter for toxic smoke, dust, mists, fumes. Furnished in a strongly constructed metal-reinforced fiber case built to withstand moisture and hard usage, each mask is supplied with a spare canister.

Manuals for Foremen Meet Wartime Needs

To help industrial foremen meet wartime demands, Elliott Service Co., New York City, offers seven practical booklets by Glenn Gardiner on present-day supervisory problems, as follows:

"How to Train Workers Quickly," a manual for training men and women in wartime. The latest and best methods of job instructor training are incorporated in this booklet. Here also is a practical follow-up or refresher for any job instructor training that foremen, supervisors and department heads may have had.

"How to Handle Grievances"—All too many of the major controversies arising within industrial organizations grow out of ill-advised handling or neglect of little grievances. This short manual has become a standard guide for good supervisory practice and labor relations.

"How to Create Job Satisfaction," a manpower maintenance manual for foremen. Keeping workers satisfied and on the job today is a more serious problem than ever before. How to get new employees off to a good start, how to make jobs desirable, how to get the right men and women on the right jobs, how to build a group that pulls together—these and many other problems are discussed and solutions offered.

"How to Cut Waste"—Upon foremen,



SLICK AT LEVELING SLACK



BAKER BULLDOZERS

At scores of strip mines, Bakers have definitely proved the fast, low cost way to level slack. "Pay for themselves on this operation alone," reports one operator. That's only one use—Bakers are never idle around strip mines. They speed stripping operations, shovel loading, road building, car spotting and cleaning up of pit floors.

The Bakers shown—at Catlin, Ill. and Hopedale, Ohio—quickly returned their cost at these mines and are presently helping greatly to alleviate the manpower shortage.

Send for Catalog 834-A.

THE BAKER MANUFACTURING CO.
514 Stanford Avenue Springfield, Illinois



BAKER

The Modern Tractor Equipment Line
for EARTH MOVING
LEVELING AND GRADE BUILDING
SNOW REMOVAL
ROAD MAINTENANCE

department heads, and supervisors, more than anyone else, depends the care with which workers avoid waste, excessive wear and breakdown of equipment. This booklet provides the foreman with a 4-step plan to cut waste.

"How to Get Out More Work"—The ability to use manpower, machines and "plan-power" effectively is an outstanding requirement of a good supervisor today. The reader will find here much useful information showing him how to study his present job methods, how to plan his work, and how to develop better methods for doing each job.

"How to Correct Workers." Wartime places exacting demands on the supervisor. Situations needing correction promptly are often neglected, with the result that they then become increasingly difficult to correct. The text is constructive and is written with the viewpoint that workers who get "off the beam" must tactfully and effectively be corrected so that quality and quantity production can be maintained.

"Qualities of a Good Boss" is a practical self-rating checkup for persons in supervisory positions. Placed in the hands of a new or experienced foreman these outlines give the reader an opportunity to rate himself and discover his weak points. Here is a correct and stimulating guide for self-improvement.

•

Maintenance Tips to Prolong Life of Trolley Shoes

"Trolley shoes are generally recognized as being expendable items and as such, subject to wear and frequent replacement." O-B Haulageways points out. "However, if an intelligent maintenance program is followed, considerable life may be added, not only to the shoes themselves but to the trolley wire as well. Here are a few things to look for:

"1. Keep trolley wire properly lubricated. O-B recommends use of trolley-wire lubricant which deposits a fine film of graphite on the wire, filling the interstices and providing a smooth, highly burnished surface for the collector.

"2. Do not use too much lubricant, as this builds up and tends to form an insulation around the wire. Experience will show the best frequency to follow. A good principle to keep in mind is 'When bright copper begins to appear on the trolley wire, it's time to lubricate.'

"3. In service, sharp edges and cones will appear at ends of shoe, damaging to both shoe and wire. After $\frac{1}{8}$ in. of shoe has worn, remove and grind out groove to original smooth surface. Repeat when another $\frac{1}{8}$ in. has worn away.

"4. Use no more pole tension than necessary. Trolley shoes require considerably less tension against the wire than wheels to avoid dewirements, due to their longer contact surface and smoother riding qualities.

"5. See that shunt and motor cable connections are tight. Inspect shunt periodically for wear and replace when necessary."

Industrial Notes

GENERAL ELECTRIC Co., Schenectady, N. Y., has appointed Ralph J. Cordiner as assistant to the president. Mr. Cordiner, who resigned in June as vice chairman of the War Production Board, formerly was president of Schick, Inc., of Stamford, Conn., prior to which he was manager of the appliance and merchandise department of General Electric. His office will be in New York City.

WORTHINGTON PUMP & MACHINERY CORP., Harrison, N. J., has acquired Ransome Machinery Co., Dunnellen, N. J., as a wholly owned subsidiary. Designer and builder of machinery since 1850, Ransome manufactures concrete mixers, road-paving equipment, welding positioners and turning rolls. L. E. Hammer has joined the organization as assistant works manager of its Moore steam turbine division, Wellsboro, N. Y. A graduate of the University of Pittsburgh, his experience has been chiefly in the field of steam-turbine manufacture.

BUDA Co., Harvey, Ill., announces that C. N. Guerasimoff, formerly assistant chief engineer, has been appointed chief engineer of the engine division. He has been with the company for nine years serving as mathematician, engineer on stress analysis and design engineer on gasoline and diesel engines. From 1939 to 1940 he was in charge of development and testing of diesel engines. In August, 1941, he was appointed assistant chief engineer in charge of the radial diesel engine division.

ROBINS CONVEYORS, INC., Passaic, N. J., has added Francis O. Clukies to its sales staff. He will specialize in products of the Mead-Morrison Division. He was with the Mead-Morrison Mfg. Co. about 30 years before Robins bought out the materials handling end of that company. In the interim he was in business for himself. He will work out of the New York office of Robins.

GATES RUBBER CO., Denver, Colo., received the Army-Navy "E" award at formal presentation ceremonies Aug. 29 in the Denver Auditorium.

DOW CHEMICAL Co., about to open new offices in Philadelphia and Boston, has named Clayton S. Shoemaker as eastern sales manager and Frederick A. Koch as assistant eastern sales manager, with offices at 30 Rockefeller Plaza, New York City. Alexander Leith, Jr. will be manager of the Philadelphia office and Alfred A. Lawrence manager of the Boston office. Ralph E. Dorland continues as manager of the New York office.

BRISTOL Co., Waterbury, Conn., manufacturer of automatic control and recording instruments, received the Army-Navy "E" production award July 29.

UNION WIRE ROPE CORP., Kansas City, Mo., has received the Navy "E" flag for the third time for 18 months of production meeting "E" award standards.

AUSTIN-WESTERN ROAD MACHINERY Co., Aurora, Ill., has been awarded the Army-Navy "E" pennant for production excellence.

WESTINGHOUSE ELECTRIC & MFG. Co., has named Ralph C. Stuart as manager of the Lamp Division, with headquarters in Bloomfield, N. J. Mr. Stuart, who has been with Westinghouse for 25 years, will have charge of all activities of the Lamp Division, including sales, illumination engineering, district office activities of the Lamp Division, as well as manufacturing and engineering in the division's five plants in New Jersey and West Virginia.

MACK TRUCKS, INC., New York City, has elected C. T. Ruhr as president. Joining the company in 1912, he had been executive vice president of Mack since last January, following the death of E. C. Fink, former president and board chairman. Prior to that time he had been operating vice president in charge of factories.

IRON & STEEL PRODUCTS, INC., Chicago, has appointed Adolph ("Ad") G. Schroeder as manager of its machinery department, succeeding A. E. Waleski, resigned.

RELIANCE ELECTRIC & ENGINEERING Co., Cleveland, Ohio, has appointed Fred E. Harrell, as chief engineer, reporting to A. M. McCutcheon, engineering vice president. Mr. Harrell, who was assistant chief engineer, has been acting as executive director of a new marine division plant for Reliance. He went to Reliance in 1924 upon graduation in electrical engineering from Purdue University.

ATHEY TRUSS WHEEL Co., Chicago, has appointed R. J. Nadherny as production manager. He has had 20 years' experience with equipment similar to the products manufactured by Athey; seven years of this time was spent in sales engineering capacities with the Mercury Mfg. Co., Chicago.

WICKWIRE SPENCER STEEL Co., New York City, has elected E. Perry Holder as president. Formerly president of the Vulcan Iron Works, Wilkes-Barre, Pa., Mr. Holder succeeds E. C. Bowers, connected with the company since 1911 and president since 1926. Mr. Bowers resigned because of serious illness but will continue as a member of the board of directors and executive committee and act in an advisory capacity. T. H. McSheehy has been named as sales manager, wire rope division, effective Sept. 1. J. A. Old, who has been with the company a number of years, succeeds Mr. McSheehy as Pacific Coast sales manager.

National Malleable Observes Diamond Jubilee

The history of the National Malleable & Steel Castings Co. is portrayed in a 36-page book published on the occasion of the company's 75th anniversary. Incorporated in Cleveland in 1868 as the Cleveland Malleable Iron Co., it pioneered in bringing the production of malleable iron into the Midwest. Its founders Alfred A. Pope, John C. Coonley, J. H. Whittemore and Bronson B. Tuttle, established other malleable iron foundries in Chicago, Indianapolis and Toledo, which in 1891 were combined to form the National Malleable Castings Co. The

HOW TO SOLVE Operating Problems with *Correct Lubrication*

Here's a
"Hot Spot"
for Oil

Those Valves Must Stay CLEAN!

HERE'S WHAT dirty discharge valves can result in: *Leakage of air, decreased capacity, lower efficiency, higher discharge temperature.*

For assurance of clean valves—use the correct oil.

The oil—carried past the valve by the compressed air—coats it with a necessary oil film.

The oil must not oxidize on this "hot spot." That is why it must provide:

1. High chemical stability—freedom from deposit.
2. High lubricity—full protection to piston and cylinder with minimum feeds. This minimizes the amount carried to the discharge valves, further safeguarding against deposits.

You'll find Gargoyle D.T.E. Oil does both jobs well. It will help you secure full capacity output with minimum time and expense needed for maintenance or repairs.

SONON-VACUUM OIL CO., INC.—Standard Oil of N.Y. Div. • White Star Div. • Lubrite Div. • Chicago Div. • White Eagle Div. • Wadham Div. • Magnolia Petroleum Co. • General Petroleum Corporation of Calif.



CALL IN **SONON-VACUUM**

ONE OF A SERIES OF SUGGESTIONS TO AID PRODUCTION

name now used was adopted in 1923.

National headquarters and research laboratories are maintained in Cleveland, while works are situated in Cleveland; Cicero and Melrose Park in the Chicago area; Indianapolis and Sharon, Pa. Sales offices are in Cleveland, Indianapolis, Chicago, New York, Philadelphia, St. Louis and San Francisco.

Products of "Malleable" have played important parts in the evolution of American transportation industries, the history points out. "We made castings 75 years ago for carriages, wagons and buggies," the book states. "These products were followed by castings for the railroad industry, the shipbuilding industry and the automotive industry. We are already producing certain types of castings for the aviation industry, and believe that this newest field of transportation may be of greater importance to us in the future."

Some of the other industries served by National Malleable are iron and steel, metal mining, coal mining, agricultural implements, pipelines, construction, and hardware and plumbing supply.

All the company's plants are now virtually 100 percent on war production. The Sharon works received the Maritime Commission's "M" pennant and award in August, 1942, and an additional star for the pennant in April of this year, while the Indianapolis works was given the Army-Navy "E" flag and award in June.

Officers include Henry F. Pope, chairman of the board; Charles H. McCrea, president; James A. Slater and Walton L. Woody, vice presidents; Clever H. Pomeroy, secretary and treasurer; Wilson H. Moriarty, assistant to president, and Benjamin Nields, assistant vice president.

C. W. Waterman Sr. Is Dead

C. W. Waterman Sr., first vice president in charge of sales of the McNally-Pittsburgh Mfg. Corp., Pittsburgh, Kan., with which he had been associated for the last 25 years, died Aug. 7 in Chicago after an illness of three days. He first became identified with the coal industry when he entered the employ of the Western Coal & Mining Co., working in the accounting department and later entering the engineering field. Subsequently he joined the Ira Fleming interests as general superintendent of mines at Radley and in the Scammon area of Kansas.

In 1914 he was one of the organizers of the General Machinery & Supply Co. Leaving that company, he formed the Barton Ridge Coal Co., which engaged in strip mining near Liberal, Kan. When the latter's company's holdings were worked out Mr. Waterman joined the McNally firm and remained with it until his death.

Trade Literature

BEARING LUBRICATION—Farval Corp., Cleveland, Ohio. Bulletin describes "the Multival system," said to be an improved method of providing positive lubrication to a group of bearings from a central distributing block. This system delivers lubricant to individual bearings under pressure, oil or grease being supplied to the multi-

ple valve blocks by means of a manual or power-operated portable gun.

BUYING DATA—Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. New simplified buying data in bound and loose-leaf form for quicker selection, easier ordering and quicker delivery. Bound books contain prices, dimensions, application data and descriptions. The 180-page "Motor Buying Data" covers popular types and ratings of motors (up to 100 hp.), gearmotors and m.g. sets. "Control Buying Data" (276 pages) lists a wide variety of controls and accessories for d.c. single-phase squirrel-cage and wound-rotor motors. For the use of large-scale purchasers, the motor and control loose-leaf book contains complete product listings, plus information on special features required for specific industries. Pricing data are kept up to date by the issuance of new price supplements. Buyers of motor and control may obtain copies from the company's district offices only—no mailings from Westinghouse headquarters at East Pittsburgh.

ELECTRICAL MAINTENANCE—Ideal Commutator Dresser Co., Sycamore, Ill. Handbook tells how to keep motors and generators operating continuously at peak efficiency without dismantling. Equipment illustrated and described includes industrial electrical equipment, variable speed transmissions, machine-tool accessories, wiring devices and tools, rechargeable battery for flashlights.

ELECTRONIC TUBES—General Electric Co., Schenectady, N. Y. Book GEA-4116, titled "How Electronic Tubes Work," is designed primarily for industrial engineers. Illustrated with 117 sketches and halftones, the book is a primer whose main emphasis is on how the electronic tube operates. The eight basic types of industrial electronic tubes and their uses are described.

GEAR-MOTORS—General Electric Co., Schenectady, N. Y. Bulletin GEA-1437D describes the many types of gear-motors furnished by G.E., lists their advantages, and indicates the various locations where their use is most desirable. Also given are descriptions of the mechanical features of these motors, electrical characteristics of the polyphase motors which are integrally built into them, and charts showing their horsepower-speed ratings.

INDUSTRIAL INSTRUMENTS—Bristol Co., Waterbury, Conn. Bulletin DM006, containing general information on industrial instruments for controlling and recording war-time processes, is virtually a buyers' guide of air- and electric-operated controllers, recorders, indicators, and telemetering recorders and controllers. Bulletins covering each type of product are listed for those interested in further details.

MECHANICAL AND ELECTRICAL TESTING—Delta-Star Electric Co., Chicago. Booklet outlining mechanical and electrical testing facilities shows million-volt surge generator testing equipment, oscillograph, optical comparators, Rockwell hardness tester, radio noise testing with diagrams, mechanical testing equipment, heat runs, etc.

METALLIZING—Metallizing Co. of America, Chicago. Catalog deals with all phases of the Metallizing process, classified according to industry, and covers every major field in which metallizing is effecting economy in time and money in the maintenance and repair of costly and hard-to-replace equipment. The Mogul metallizing gun is fully illustrated and described part by part, with complete specifications and engineering data. Likewise, the accessories which are included in a typical metallizing set-up are shown. The equipment section of the book also deals with the new Mogul electric bonder, a unit developed for bonding pre-hardened and heat-treated surfaces.

PUMP TEST CODE REVISED—Hydraulic Institute, 90 West St., New York, 6, N. Y., national trade association of pump manufacturers, announces complete revision of the test code section of its standards. This section contains specific recommendations for testing centrifugal and rotary pumps, both for acceptance tests in the field and in the plant of the pump manufacturer. The code contains the limiting conditions for all methods of quantitative determination of capacity, head and power input, whereby accuracy for an acceptance test can be obtained; 50c. per copy.

SAFETY GOGGLES—W. S. Wilson Corp., New York City. Folder describes the All-Safe MonoGoggle, said to provide adequate eye protection for a wide range of industrial operations. It is extremely light in weight, contoured to fit the face comfortably and can be worn over prescription glasses.

SAWS, MACHINE KNIVES AND FILES—E. C. Atkins & Co., Indianapolis, Ind. Catalog 22 describes the company's extensive line of tools, which incidentally has been temporarily curtailed by discontinuance of manufacture of slow-moving numbers for the duration of the war.

TROLLEY-REEL LOCOMOTIVES—Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. Booklet B-3232 describes explosion-tested locomotives designed for use in operations where gas exists in explosive quantities or mixtures. They are available in a range of sizes suitable for operation on track gages from 36 to 56½ in. and for 250- or 500-volt d.c. Special features described are the "Breather," a motor-driven fan and labyrinth arrangement; the self-equalizing type of ribbon-wound resistor, so designed that various sections are said to balance one another; the cam controller of the parallel-reversing type for single-handle operation; and the power take-off.

WASH FOUNTAINS, SHOWERS AND DRINKING FOUNTAINS—Bradley Washfountain Co., Milwaukee, Wis. Catalog 4308 contains illustrations and information regarding new Bradley washfountains, multi-stall showers and drinking fountains which have been redesigned to save vital war materials. Specification data and washroom planning suggestions are included and advantages of improved sanitation with definite reductions in maintenance and installation costs are explained.

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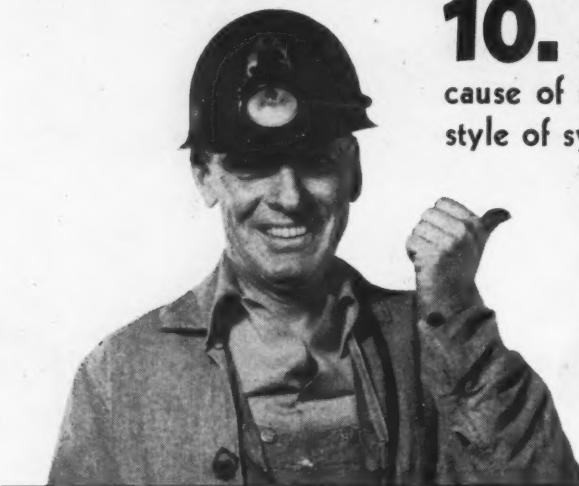
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TWINS

Fathers swell with pride when the nurse announces TWINS. They get twice what they bargain for. So with coal operators who dustproof coal with clean, odorless Calcium Chloride; they expect one service — they get two. They find when winter comes that coal, dustproofed with Calcium Chloride, is also freezeproofed. Their dustproofed coal pleases the user. Their freezeproofed coal saves dealers untold delay in unloading. Unfrozen coal releases war important cars quickly — saves labor and equipment. Enjoy these twin services "Dustproofing and Freezeproofing." Send for Bulletin 37 now. Calcium Chloride Association, 4145 Penobscot Building, Detroit 26, Michigan.



10. Wheat, originator of the Lamphouse Self-Service System, represents the ideal electric cap lamp because of its simplified design being more adaptable to this style of system. The miner slips the headpiece on the key of the charging rack — a half turn of the headpiece locks it to charging contacts — yes, just as simple as that. And to remove from charge, the headpiece is disconnected by a half turn in the opposite direction. Wheat is the only approved Electric Cap Lamp that can be charged without opening the battery-cover, or removing the headpiece.

Check these Features!

- 1** Two bulbs (one for emergencies) — miner is never in the dark.
- 2** Center mounted, Krypton-filled bulb, gives 20% more light — no dark "shadow spot" in beam.
- 3** Choice of 3 reflectors gives narrow concentrated beam, a medium beam, or a widespread beam of light — suits all working conditions.
- 4** Headpiece weighs less than 6 ounces, Lamp Cord 6 ounces, Battery 62 ounces — Total weight of Lamp complete 74 ounces.
- 5** Headpiece molded of strong bakelite; sealed, moisture-proof and dust-proof.
- 6** Rubber battery case — non-conductor of electricity — a valuable safety feature.
- 7** Battery solution (free) limited to one ounce total both cells.
- 8** Lead-acid type battery maintains high voltage throughout shift (80+% efficiency) — year after year.
- 9** Battery charged through headpiece and cord of cap lamp — a daily test of all connections.
- 10** Designed for self-service charging system for lowest lamphouse operating cost.
- 11** To charge, headpiece is simply slipped on to key in charging rack, and turned to make contact. Nothing to take apart — unit-sealed construction.
- 12** A payment plan (purchase or rental) to meet the requirements of companies — large and small.



Write today —
WHEAT LAMP SALES, INC.
1501 Kanawha Valley Bldg., Charleston, W. Va.

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LIGHTING FOR 25 YEARS
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TIMELY OPERATING IDEAS



Clocks and Counter Provide Quick Operating Picture

A quick picture of how the coal has been moving, how steadily the tipple has been operating and, if it has been down, why and for how long, is provided by the operating board shown in the accompanying illustration. This board is installed in the superintendent's office at Island Creek No. 22 mine, Island Creek Coal Co., Holden, W. Va.

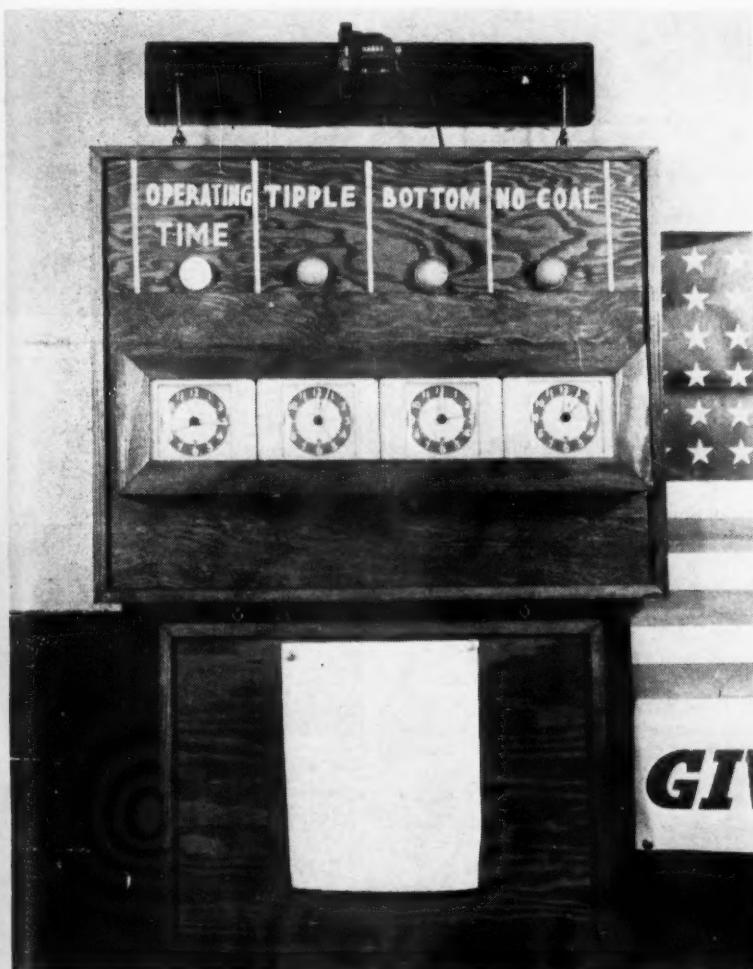
Three lights, controlled by the operator, are installed on the tipple in locations where they can be seen readily from any nearby point. A red signal means trouble on the bottom; white, waiting on coal; green, trouble in the tipple. Similar signal lamps are mounted on the operating board.

The operating time clock is hooked

into the power circuit, while the other three are hand-controlled by the tipple operator. The total of the times indicated by the four clocks must add up to the total shift time and thus all lost time is accounted for.

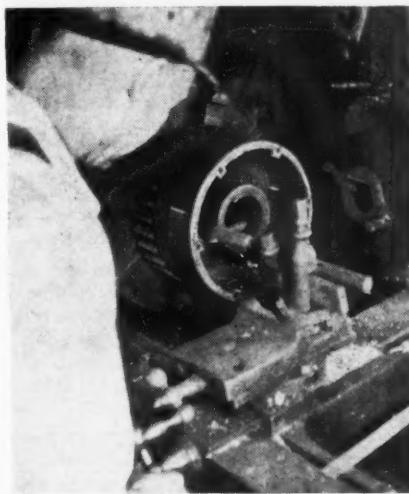
The counter at the top of the board is operated by electrical impulse actuated by the rotary car dumper at the bottom of the shaft. It shows the cars dumped and provides quick information on the rate at which the coal is moving from the mine. At night, the watchman notes the time shown by each clock on the sheet and sets all four back to twelve at the start of the first shift.

This system, according to J. S. McGhee, superintendent, keeps the coal rolling and provides him with immediate information on the daily progress as soon as he returns to the office.



Lathe Used as a Planer On Clutch Feathers

As the feathers in the clutch bodies of loading machines become furrowed by the clutch plates and do not release readily, most mines that have much loading machine equipment have a planer or shaper with which they may be smoothed up. Sey-



Loading-machine clutch shell chucked in a lathe. The feathers may be seen at the bolt holes.

mour Coal Mining Co., Herrin, Ill., had neither, so one of the mechanics converted a lathe into a hand-operated planer.

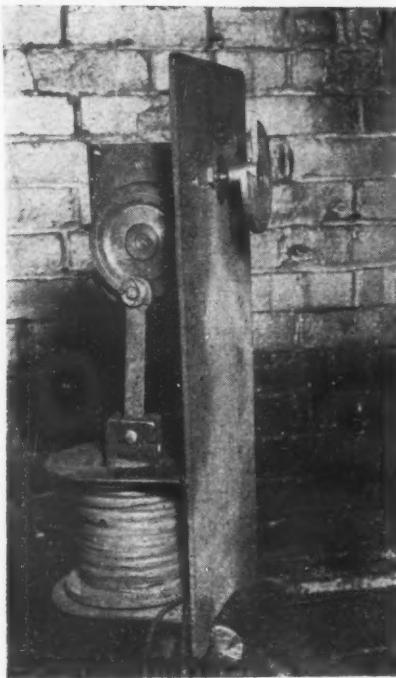
The clutch body is chucked and the spindle locked in place. A suitably shaped tool is clamped in the tool post. Then the carriage hand feed and the cross feed are manipulated by hand to plane the furrows out of the feathers. When the feathers are smoothed up the clutch operates smoothly until it becomes furrowed again.

Inductance Lamp Flashing Avoids Radio Trouble

To eliminate radio interference from fan continuity signals an unusual method of dimming blinker lamps has been put into use by maintenance engineers of the Consolidation Coal Co. in northern West Virginia. Instead of breaking the current it is reduced gradually and without steps to a point where the lamp filament no longer glows.

This is done by increasing and decreasing the inductance of a coil in series with the lamp. This is effected by moving a laminated plunger in and out of the

Quick operating information is provided by this clock and counter board.



To the worm reducer have been added a plunger and coil.

coil. The illustration is a shop view of a unit ready for installation on a fan motor. The worm reducer is a standard 60-ratio unit, several of which the coal company mechanics have made in the Monongah shop for driving flashing contactors. The crank disk, connecting rod, plunger and coil constitute the added parts. With a 900-r.p.m. fan-driving motor, the lamp dims out completely 15 times per minute.

Lamp and coil are in series with a normally closed air-vane contact in the fan adit or shaft so that a lamp staying out indicates either one or more of the following: (1) cessation of air flow, (2) fan motor stopped, (3) lamp burned out, (4) failure of power for signal circuit, or (5) a broken conductor of the signal circuit.

The inductance of the coil is designed for a 100-watt tungsten lamp. A smaller lamp cannot be substituted successfully because that particular amount of inductance would not then lower the current sufficient to put the lamp out. When a make-and-break was used, radios within a quarter of a mile of the fan or the lamp circuit picked up the interruptions.

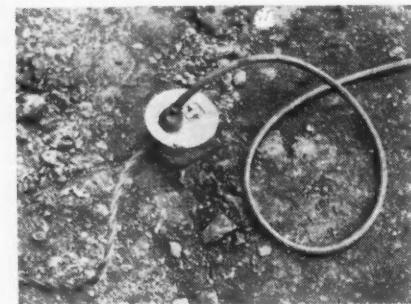
Positive Endgate Operation By Hook-Bar Lifters

For dumping endgate cars with outside hinges, Cecil Spencer, chief electrician, Guyan Eagle Coal Co., has developed the hook-bar lifters shown diagrammatically in the accompanying sketch for the company's mine at Phico, W. Va. It is

reported to work every time. If the hinge on any car is bent, it is stated, the shape of the hook is such that it catches it and shoves it either way so that both hooks catch as the car drops down in dumping. This arrangement, it is pointed out, will not work with a mixture of different types and widths of cars, but does serve well with outside-hinge endgate cars of the same style and width.

Double Extension Cords Handy in Machine Work

As simple a thing as an extension cord may be improved. The quick inspection, lubricating or repair of a large machine like a truck, locomotive or a loading machine may require more than one man at more than one place at the same time. A device to double up heavy extension cords at the working end of the line was worked out by a mechanic at the Fiaff mine, Trux-Traer Coal Co., Canton, Ill.



Heavy double receptacle for multiple extension cords.

The steel junction box, attached to the twisted cord, has fitted into it a heavy double receptacle. The twisted cord attaches to a receptacle inside the shop and reaches outside a convenient distance from the machine to be worked on. The rubber cord is one of two possible extensions which may be used for portable lamps or portable motor-driven tools.

Arc-Welding Loader-Rope Ends Found a Time Saver

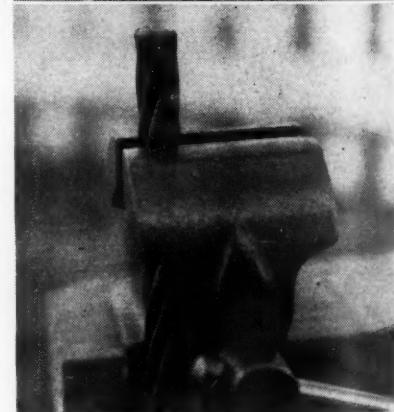
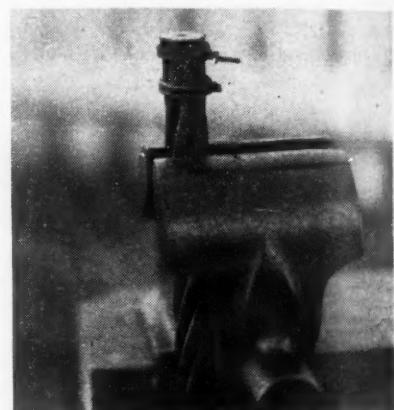
Arc-welding the ends of the loading-machine ropes, rather than bronze-welding them, saves considerable time, declares Frederick Boch, Taylorville, Ill. "I have seen an article in one of the late issues of Coal Age," writes Mr. Boch, where one mine was bronze-welding the ends of Joy ropes and I think that is much too slow a process these days. We used to bronze-weld the ends also, for a number of years, but since we have tried arc-welding and found that it only takes about a minute to arc-weld one where it takes about 15 minutes to bronze-weld one, we have since been

Cutting Delays

When time is of the essence, as always it is in emergencies, borrowed ideas, plus ingenuity in applying them, can go far toward cutting plant delays to a minimum. It is on these occasions that the operating ideas appearing in Coal Age serve most usefully. One seemingly matter-of-fact idea may be the means of saving lives and dollars. Here is the place for yours. Include a photograph or rough sketch if it will make it clearer. Those accepted for publication are paid for at a minimum rate of \$5.

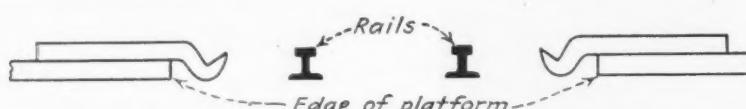
arc-welding them and find that this holds the wires together just as good if not better.

"We have been burning the ropes to length and then grinding them smooth on the end, which leaves them clean for welding. You will notice in one of the pictures that we wrap two wires around the rope



The upper view shows the rope with two wires on it prior to welding; the lower the completed arc weld.

until it is welded. The other picture shows the rope with the wires removed after being arc-welded. I think that this idea will be a help to many mines and will save many an hour of time, which all helps toward the war effort."



Showing diagrammatically the use of hook-bar endgate lifters.

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Therefore it is more important than ever that every shot be a telling one!

King's patented Red Crown Class A permissible powder is continuing to prove its outstanding advantages in an ever-increasing number of modern mines.

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COMPLETE EXPLOSIVE EQUIPMENT FOR THE COAL MINING INDUSTRY





Official U. S. Army Photo

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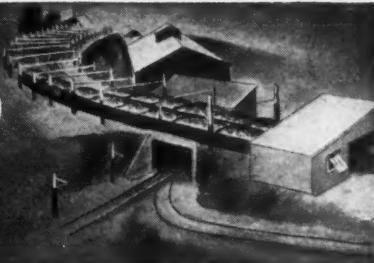
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WHEREVER there's action . . . in the air . . . on land or on the sea, you will find tanks, planes and guns made from STEEL produced by COAL. Increased coal production makes possible increased steel production for the essentials of war and Cincinnati Chains, Bits and Cutter Bars are producing a larger tonnage for many mine operators at a lower cost per ton. Our organization and our employees have attained a high degree of production perfection not only in turning out finer, tougher Chains, Bits and Cutter Bars, but in the making of precision parts used in turning out superior mechanized fighting equipment. Cincinnati Duplex Chains and Double Ended, Reversible Bits are doing a war time production job at a savings to mine operators. May we be of service to you? . . . For further information, write today.

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COAL AGE NEWS ROUND-UP



Government Releases Over 100 Coal Mines; Operating Organization Expanded

GOVERNMENT operation of coal mines was marked by two apparently opposing trends in August. On the one hand, the Coal Mines Administration began returning properties to their owners. On the other, it added to its organization, apparently with the idea that government operation might continue for some time, meanwhile revising the terms on which return would be made and also the regulations governing control by management over finances at operations where control remained in effect.

Return of the mines of 58 bituminous companies in two groups was accomplished in August. The first group comprised the Barnes Coal & Mining Co., Coshocton, Ohio; Elk River Coal & Lumber Co., Widen, W. Va.; Rail & Lake Coal Co. and Sheban Mining Co., eastern Ohio; and the Shuff Coal Co., Oneonta, Ala.

Some 100 mines operated by 53 additional companies were returned Aug. 23, bringing up the question of whether the strike provision in the last United Mine Workers' order returning the men to work would automatically go into effect. This order extended the working period to Oct. 31 or until government operation terminated. In contrast to the first five properties, many in the new group had been operating under union contracts. "No comment" was the way in which Lewis greeted the news. The companies in the second release in August were:

Colorado & Utah Coal Co., Denver, Colo.; Island Creek Coal Co., Huntington, W. Va.; Johnstown Coal & Coke Co., Johnstown, Pa.; Marianna Smokeless Coal Co., Pond Creek Pocahontas Co., Huntington; Red Jacket Coal Corp., Columbus, Ohio; Roundup Coal Mining Co., Roundup, Mont.; United Electric Coal Cos., Chicago; Windsor Coal Co., McAlester, Okla.; B. & R. Coal Co., Renton, Wash.; Bird Coal Co., Philadelphia; Dixport Coal Co., Charleston, W. Va.; Kaiser Co., Inc., Oakland, Calif., and Sunnyside, Utah; Katherine Coal Mining Co., Saxman Coal & Coke Co., Philadelphia; Wasson Coal Co., Harrisburg, Ill.; Allegheny Pittsburgh Coal Co., Pittsburgh, Pa.; Carbon Fuel Co., Charleston; Greensburg Connellsville Coal & Coke Co., Greensburg, Pa.; Hanna Coal Co., Jefferson Coal Co., Cleveland; Pittsburg & Midway Coal Mining Co., Pittsburg, Kan.; New Long Ridge Coal Co., Inc., Pineville, Ky.; Consumers Mining Co., Harmarville, Pa.; Calumet Fuel Co., Delcarbon, Colo.; Carter Coal Co., New York.

Hatfield-Campbell Creek Coal Co., Cincinnati; Mt. Olive & Staunton Coal Co., St. Louis, Mo.; Crawford Mining Co., Crawford, Tenn.; Union Collieries Co., Oakmont, Pa.; Pennsalt Coal Co., Philadelphia; Rail & River Coal Co., Bellaire, Ohio; Logan Clay Products Co., Logan, Ohio; Colorado Fuel & Iron Corp., Denver, Colo.; Industrial Collieries Corp., Bethlehem, Pa.; Beatty Coal Co., Latrobe, Pa.; Windsor Power House Coal Co., Windsor Heights, W. Va.; Raleigh Coal & Coke Co., Raleigh, W. Va.; Lorado Coal Mining Co., Lorado, W. Va.; Boone County Coal Corp., Sharpes, W. Va.

Hook Coal Co., Coshocton, Ohio; Hume-Sinclair Coal Mining Co., Huntington-Sinclair Mining Co., Kansas City; Pine Hill Mining Co., Madisonville, Ky.; Seneca Coal & Coke Co., Broken Arrow, Okla.; Sentry Coal Mining Co., Madisonville, Ky.; Henry Clay Coal Mining Co., Philadelphia; Middle River Coal Co., Fulton, Mo.; Smith & Stokes, Madisonville, Ky.; Standard Coal Co., Vincennes, Ind.; West Kentucky Coal Co., Earlington, Ky.

A later announcement listed the return of the following additional properties: Alabama Fuel & Iron Co., Birmingham; Carr Coal Co. and Deer Field Coal Co., Wilkinsburg, Pa.; Eberhart Coal Co., North Industry, Ohio; Elm Creek Coal Co., Pella, Iowa; John M. Hirst & Co., Cleveland; Knott Coal Corp., Lexington, Ky.; Nash Coal Co., Raven, Va.; Stony River Coal Co., Thomas, W. Va.; Chloe Creek Coal Co., Pikeville, Ky.; Garaux Bros. Co., Canton, Ohio; Jones Elkhorn Coal Corp., Pikeville, Ky.

Appointment of seven key officials to serve under himself and Deputy Administrator Newton was announced meantime by Mr. Ickes. These men, it was stated, "will form the nucleus of an organization to effectuate maximum coal production under government control." With their appointment, the government operating organization lines up as follows:

Coal Mines Administrator—Harold L. Ickes.

Deputy Administrator—Carl E. Newton.

Associate Deputy Administrator—Walter J. Tuohy, coal vice president, Chesapeake & Ohio Ry., and formerly president, Globe Coal Co., Chicago.

Division Chief (executive functions to be assigned)—Huston St. Clair, president, Jewell Ridge Coal Corp., Virginia Smokeless Coal Co. and Pocahontas Mining Corp., Tazewell, Va.

Division Chief (executive functions to

be announced)—H. J. Connally, president, Pennsylvania Coal Co., Dunmore, Pa.

Division Chief (executive functions to be announced)—D. C. Kennedy, executive secretary, Kanawha Coal Operators' Association, Charleston, W. Va.

Chief, Legal Division—Arnold Levy, formerly general counsel, Bituminous Coal Division, and legal adviser, Solid Fuels Administration.

Chief, Information Division—L. W. Mosby, formerly chief of information, Bituminous Coal Division and SFA.

Chief, Finance and Accounting Division—Albin J. Plant, formerly director of finance, War Manpower Commission, and chief accountant, Public Works Administration.

Health and Safety Division—T. J. Thomas, Valier Coal Co., director, with John E. Jones, Old Ben Coal Corp., Benton, Ill., and Harrison Combs, United Mine Workers of America, Washington, D. C., as associates. Mr. Thomas retains his duties as director of production, Coal Mines Administration, and associate deputy solid fuels administrator.

The fact that Secretary Ickes, who, on July 28, conferred upon himself and Mr. Newton as Coal Mines Administrator and Deputy Administrator, respectively, authority to exercise the powers delegated to the Secretary of the Interior under the Presidential seizure order of May 1, was considering his course under the War Labor Disputes Act was brought out July 29, when he announced that he had asked Attorney General Biddle for a ruling as to his "rights, duties and responsibilities" under the new act. One point, apparently, was whether the mines should be returned individually or whether the return should be made wholesale under Sec. 3.

Return of the mines on the ground that productive efficiency had been restored was requested in a telegram July 30 by R. L. Ireland Jr., spokesman for the Operators' Negotiating Committee, Appalachian Joint Conference, and Edward R. Burke, spokesman for the committee of the Southern Appalachian Joint Wage Conference. The telegram read:

"We note from the report of your press conference of July 29 that you have obtained an opinion from your legal department on the question of returning to the owners their mines and other assets possession of which was taken by you under Executive Order 9340 on May 1, 1943, but that you now propose to ask Attorney General Biddle to advise you on your legal responsibilities, especially as to whether they should be returned one by one or in a single block."

"The mines in the Appalachian area

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for which we speak have already, in the words of the War Labor Disputes Act, substantially achieved 'restoration of the productive efficiency thereof prevailing prior to the taking possession thereof.'

"To be sure, the production at some mines is not as great as it was prior to May 1, but this difference is accounted for by the fact that production is always above normal productive efficiency just before the end of a contract period and that we have been steadily losing manpower to the armed forces, other industries and farms, and this has naturally reduced our productive capacity.

"We consider it your duty under the War Labor Disputes Act and the compliance order of the National War Labor Board in connection with its directive of June 18 to return our mines and other assets to private ownership and urgently request that you take immediate steps to do so."

Control Termination Revised

"Regulations for the Operation of Coal Mines under Government Control," issued May 19, were amended early in August to make them conform to the War Labor Disputes Act. The major changes were in Sec. 40, relating to the method of terminating government control. As announced Aug. 3, the amended section now makes it mandatory for the government operating managers of mines to advise the administrator when, in their opinion, the requirements for termination of possession have been met.

Upon termination, the mining company may elect to execute an instrument of ratification completely releasing the government from all claims. Or it may execute a separate instrument reserving the right to assert claims for damages suffered during the period of government control as a result of a specific order or direction of the administrator or his duly authorized agent. It, however, within ten days or other period prescribed by the administrator, the mining company fails to deliver either of the two instruments stated, the government may assume that the mining company claims, or reserves the right to claim, that operations have been for the account of the government, and consequently may assume further that the U. S. operating manager and the mining company are accountable to the government for their custodianship and disposition of the proceeds of operation. Under such circumstances, appointment of the operating manager continues and detailed statements are required for the final accounting.

"None of the provisions of this Sec. 40, and no action that shall be taken pursuant to any of them, shall be deemed to constitute acquiescence by the administrator in any claim that operations during the period of government possession and control were for the financial account of the government, or acquiescence in any other claim that the government is subject to any liability to the mining company or any other person or persons with respect to any such action, or otherwise. None of the provisions of this section nor any action taken pursuant to any of them shall be deemed to constitute a waiver by the mining company of any right which it may have to assert a claim against the

United States, except as it is waived by the execution and delivery of Instrument No. 1 or of Instrument No. 2."

A survey of productive efficiency preparatory to taking steps for mine return was instituted by the Coal Mines Administration Aug. 12, although it was stated that "relatively few" coal companies had formally requested that their properties be given back. In a telegram of that date, operating managers were requested by Mr. Ickes to supply data on restoration of efficiency, as follows:

"Under the War Labor Disputes Act possession of coal mines must be restored by the government to their owners as soon as practicable, but in any event not more than 60 days after the restoration of the productive efficiency thereof prevailing prior to the taking of possession thereof.

"I am endeavoring to ascertain the facts with reference to the coal mines for which you are operating manager so as to determine the applicability of the statutory provisions. I therefore direct you as operating manager to provide me with information showing for each of the mines for which you are the operating manager the average daily production for each of the weeks since April 1, 1943.

"I further direct you to submit your opinion, and the factual data upon which it is based, as to whether productive efficiency prevailing at those mines prior to the taking possession thereof has been restored and, if so, the date of such restoration, together with the date when the

last interruption due to a labor dispute ceased. Where an explanation is necessary in order to provide a reliable comparison of the tonnage figures for the weeks prior to and subsequent to May 1, 1943, such explanation should be supplied in detail with supporting factual data."

Wide freedom in handling their financial affairs on their own responsibility was granted to coal mining companies in amendment No. 2 to the regulations for operating mines under government control, provided they were willing to execute the necessary certificates. This amendment was issued Aug. 13 and made certain changes in Sec. 22 of the regulations and added Secs. 25 and 26. In effect, the amendments provide that if coal mining companies certify that they will not impair working capital they will be relieved of the requirements with respect to financial transactions and current accountings set forth in Sec. 26 of the regulations. "In the event a company fails to execute an instrument of agreement and certification, Sec. 26 provides that the operating manager for its coal mines may not make major disbursements of an extraordinary nature or dividend payments and may not incur any indebtedness other than in the course of normal business unless 10 days' notice of intention to make such disbursement or payment or to incur such indebtedness shall have been filed with the administrator and the administrator shall have advised the operating manager that he has no objection thereto."

48-Hour Work Week Approved for Coal Mining; W.L.B. Voids Illinois Portal-to-Portal Pay

GOVERNMENT approval of a 48-hour week for coal mining to avert a possible fuel shortage was among the outstanding events in the labor field in August. Another was the rejection by the War Labor Board of the agreement signed July 20 by John L. Lewis, United Mine Workers president, and the Illinois Coal Operators' Association. Bituminous operators also initiated legal steps to determine their portal-to-portal liability, if any, while the government continued to prosecute its case against a number of western Pennsylvania coal miners under the Connally-Smith Labor Disputes Act.

The longer work week was requested by Coal Mines Administrator Ickes in a letter to the War Labor Board Aug. 13. "It is my opinion," Mr. Ickes declared, "that if we are to be assured that the increased requirements of industry are to be fulfilled and the serious and deleterious consequences to the war economy of a deficiency in the fuel supply are to be avoided, steps must be taken immediately to institute an 8-hour work day at the mines in government possession in certain bituminous coal and anthracite fields.

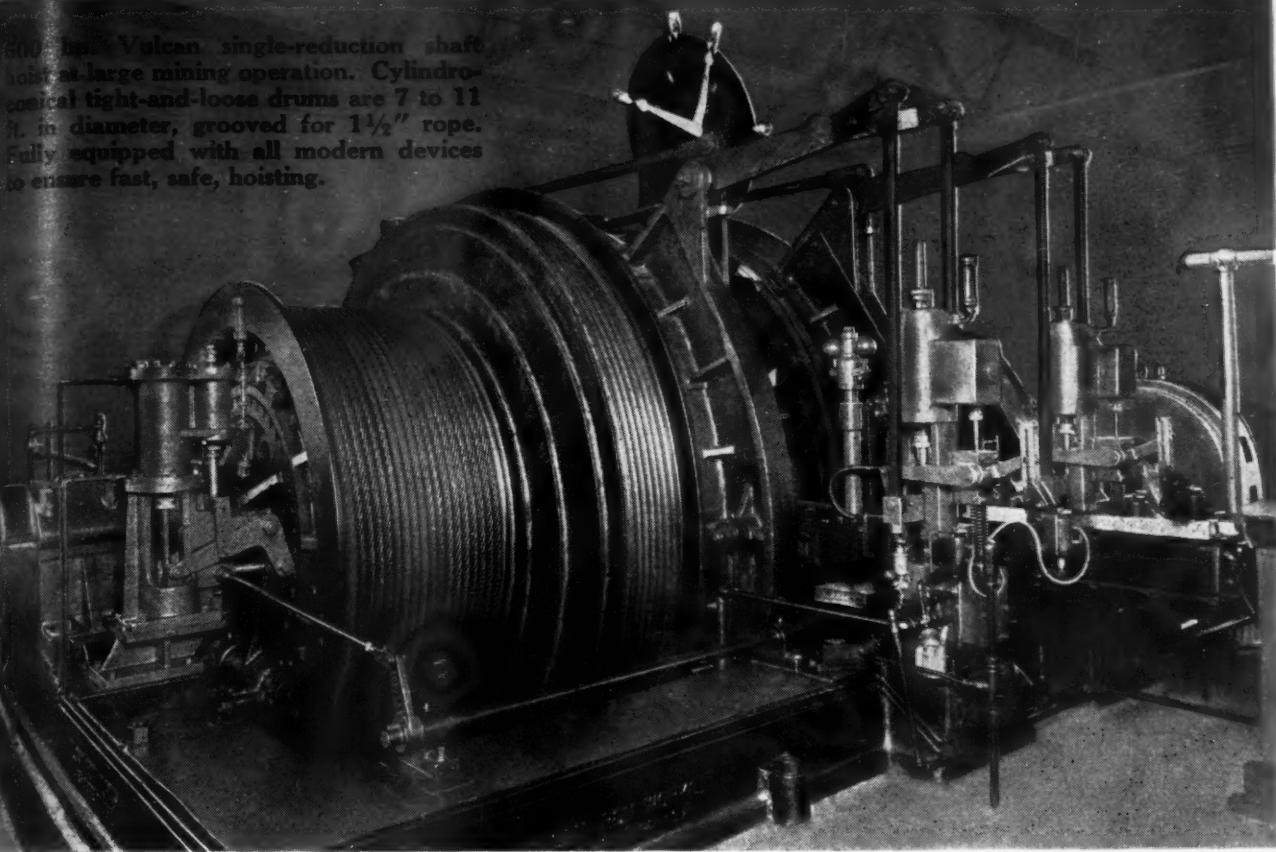
"In view of the fact that such a change in working hours at those coal mines and the payment of time and one-half or rate and one-half for the additional hour of work each day might be considered changes in the terms and conditions of employment which were in effect at the time the possession of such mines was taken by

the government, I am applying to your board, in accordance with the provisions of Sec. 5 of the War Labor Disputes Act, for such changes in the terms and conditions of employment. . . . The prescription of the 8-hour day for any mine would take the form of a direction that the mine workers be afforded an opportunity to work eight hours a day except, however, in those cases where some justifiable physical or operating reason prevents operation on that basis, and would have to be accompanied by such adjustment in maximum prices as might be appropriate, under the applicable statutes and regulations, in the light of the increased labor costs, incident to the institution of the 8-hour day at the mines."

Authorization of the 8-hour day was ordered by WLB Aug. 16, approved the same day by President Roosevelt and announced that night in a radio broadcast by James F. Byrnes, War Mobilization Director. The order provides that "the existing terms and conditions of employment in the bituminous and anthracite mines in the possession of the government are hereby changed by providing that the Secretary of the Interior may designate an opportunity to work eight hours per day, instead of the present 7-hour day, with payment at the rate of time and one-half for the additional hour of work on any day, when the eight hours are worked in conjunction with a 48-hour week schedule."

or dispute necessary comparison weeks prior to 1945, such in detail.

Their financial stability was companies in nations for government contracts to execute amendment made certain conditions and effect, the coal mining not impair believed of financial obligations set forth. "In execute an certification, fitting man not make extraordinary may not remain in the 10 days' disbursements which indebtedness the administrator shall manager that

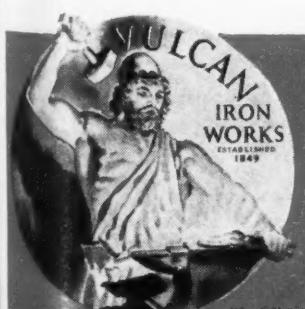


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When SPEED is demanded from the operator of a Vulcan heavy-duty hoist he can deliver plenty because his mind is free to concentrate on just that and nothing else. No mistake that he can possibly make—no electrical failure—no physical disability that might suddenly dim his mind or weaken his hand—can have any unpleasant consequence. If an error is made while the hoist is at rest it cannot start. If made while the hoist is in motion it comes to a quick smooth stop. That's ALL that can happen.

Safety comes first in the design of Vulcan heavy-duty hoists and means more than modern safety devices. It means an extra margin of strength and quality that has made them the standard of the mining world for more than sixty years.

Bulletin A-371 contains illustrations and brief descriptions of several modern Vulcan Heavy-Duty Electric Hoists. Also complete instructions for installing and adjusting ropes on large hoists with minimum difficulty and expense. If you have not already received your copy write for it today. No charge or obligation of any kind.



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The announcement caught Secretary Ickes and the Coal Mines Administration flatfooted, with the result that considerable confusion in both government circles and among the operators ensued. Several questions arose out of the terms of the order itself, including provisions for time and one-half but not rate and one-half and the limiting phrase "when the eight hours are worked in conjunction with a 48-hour week." The extent to which the order might be applied was another question. Clarification of some of these points was expected in a Coal Mines Administration order, reported to be in preparation, putting the 8-hour day into effect.

In preparation for the order initiating the 8-hour day, the acting Secretary of the Interior called a meeting of representatives of the bituminous industry for Aug. 24. Those invited were: D. W. Buchanan, Old Ben Coal Corp.; Heath S. Clark, Rochester & Pittsburgh Coal Co.; C. C. Dickinson, Dickinson Fuel Co.; J. D. Francis, Island Creek Coal Co.; Eugene McAuliffe, Union Pacific Coal Co.; J. B. Morrow, Pittsburgh Coal Co.; Harry M. Moses, H. C. Frick Coke Co.; Charles O'Neill, Barnes & Tucker Co.; George W. Reed, Peabody Coal Co.; W. L. Robison, Youghiogheny & Ohio Coal Co.; R. H. Sherwood, Central Indiana Coal Co.; Ezra Van Horn, Ohio Coal Association; L. R. Weber, Liberty Fuel Co.; J. P. Williams Jr., Koppers Co.; and R. A. Young, Durham Coal Co.

A similar meeting of anthracite representatives was called for Aug. 25. These were: W. W. Inglis, Glen Alden Coal Co.; R. E. Taggart, Philadelphia & Reading Coal & Iron Co.; and James H. Pierce, James H. Pierce & Co.

Enforcement Power Granted WLB

Some two months of effort by WLB to obtain powers for enforcing its rulings against labor unions as well as employees were rewarded Aug. 16 by a Presidential executive order permitting, among other things, impounding of union dues derived from the check-off. Pending some method of imposing sanctions against defiant unions, the board had been holding up enforcement of certain orders against employers since June 18, when John L. Lewis and the United Mine Workers refused to sign the Appalachian agreement which it had ordered. The board hailed the Aug. 16 executive order, "authorizing the Economic Stabilization Director to take certain action in connection with the enforcement of directives of the National War Labor Board" as giving "the board teeth with which to bite the employees as well as the employers in case of non-compliance with board directives."

The President's order invoked three types of penalties: control of war contracts, essential materials, transportation and fuel against employers; and withholding of contract benefits, such as dues, and cancellation of draft deferment status against employees and labor unions. The text of the order is as follows:

"In order to effectuate compliance with directive orders of the National War Labor Board in cases in which the board reports to the Director of Economic Stabilization that its orders have not been complied with, the director is authorized and

directed, in furtherance of the effective prosecution of the war, to issue such directives as he may deem necessary:

"(a) To other departments or agencies of the government directing the taking of appropriate action relating to withholding or withdrawing from a non-complying employer any priorities, benefits or privileges extended, or contracts entered into, by executive action of the government, until the National War Labor Board has reported that compliance has been effected;

"(b) To any government agency operating a plant, mine or facility, possession of which has been taken by the President under Sec. 3 of the War Labor Disputes Act, directing such agency to apply to the National War Labor Board, under Sec. 5 of such act, for an order withholding or withdrawing from a non-complying labor union any benefits, privileges or rights accruing to it under the terms of conditions of employment in effect (whether by agreement between the parties or by order of the National War Labor Board, or both) when possession was taken, until such time as the non-complying labor union has demonstrated to the satisfaction of the National War Labor Board its willingness and capacity to comply; but, when the check-off is denied, dues received from the check-off shall be held in escrow for the benefit of the union, to be delivered to it upon compliance by it;

"(c) To the War Manpower Commission, in the case of non-complying individuals, directing the entry of appropriate orders relating to the modification or cancellation of draft deferments or employment privileges, or both."

Before it got the green light on enforcement, WLB took on another coal case, that of the Illinois contract signed July 20 (August Coal Age, p. 116). Consideration of this case Aug. 3 marked Lewis' first appearance before the board, which he had previously damned in vigorous and forthright language. But there were no fireworks Aug. 3. Instead, all was sweetness and light.

Representatives of the Illinois operators stressed particularly the point that they desired to settle the portal-to-portal question upon a reasonable basis and that their agreement could in no way be considered a wage increase in disguise. The ball was carried for the United Mine Workers by Crampton Lewis, Birmingham, Ala., who had represented the iron miners in the Alabama portal-to-portal case and appeared as special counsel for the U.M.W. Both he and Lewis took the position that the miners were entitled to pay for travel time not only under the wage and hour act but under their contracts, as a just correction of a working condition. The miners, Lewis observed, had been contending for travel time for 40 years. This statement aroused the interest of several board members, with Public Member Wayne L. Morse pointing out that it was a new factor which had not previously been laid before the board. Lewis concluded the hearing with a dissertation on industry hazards, contending that traveling also was dangerous and that the miners should be paid for this risk as well.

WLB, however, rejected the union's contentions and turned down the portal-

to-portal provision of the Illinois agreement in an eight to four decision Aug. 25, the labor members dissenting. William H. Davis, chairman of the board, said the public and industry majority of the board had been unable to approve the agreement because it was not related to what the union might have recovered under the Fair Labor Standards Act and did not constitute a "genuine settlement of claims arising under the act." In effect, the board held, the \$1.25 allowance for portal-to-portal travel (August Coal Age, p. 116) was a hidden wage increase. "Not very well hidden," Mr. Davis added. All other sections of the Illinois contract were approved by the board including \$1.50 for an extra hour at overtime rate by extending the work day from seven to eight hours and 25c. a day allowed for tools, lamps and safety equipment. Since each provision of the contract is dependent on the others, however, the entire instrument is now invalid, but if the parties agree to enforce all sections except the travel-time provision they may do so.

Portal-to-Portal Suit Filed

Appalachian operators, however, continued to rest their case on the board's order of June 18 and maintained that the union should sign a contract on that basis. Meantime, they took steps to get a legal decision on their portal-to-portal liability, if any. The opening gun was filing of a suit July 31 in the U. S. District Court for the Western District of Virginia by the Jewell Ridge Coal Corp. The company asked for a declaratory judgment, holding that travel time at its mines is not time worked under the Fair Labor Standards Act. Two local unions and their officials, U.M.W. District 28 and its officials, and the international union and its president were named as defendants. Reports indicated that the Southern Coal Producers' Association and other operator groups would intervene.

The miners also filed their own suit in the U. S. District Court at Birmingham, Ala., Aug. 31. The suit asks five years' back pay for nine men, asserting that they spend two hours daily in travel underground.

A rehearing in the Alabama iron-mining portal-to-portal case was refused July 27 by the U. S. Circuit Court of Appeals for the Fifth Circuit (New Orleans). The Tennessee Coal, Iron & R.R. Co. contended that the decision would operate to include "every ore-mining employee within the meaning of Sec. 7 of the Fair Labor Standards Act." This the court denied in refusing the petition.

Trial of miners indicted in western Pennsylvania for calling and fostering strikes in violation of the War Labor Disputes Act was set for Sept. 1 by Federal Judge F. P. Schoonmaker Aug. 18. Judge Schoonmaker previously had set Aug. 9 for arraignment of the defendants. In the Aug. 18 hearing, he overruled motions to quash the indictments on the ground that the act was unconstitutional.

After pleas of no defense had been entered, 27 of the defendants were placed on probation for three years after sentences of six months were suspended by Judge Schoonmaker. Three other defendants were ill.



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WLB Gets Anthracite Case; Negotiations Adjourned

The War Labor Board again assumed jurisdiction in the wage negotiations between the United Mine Workers and the anthracite operators Aug. 18. WLB, which had previously taken over April 30, only to direct a resumption of negotiations, again moved in at the request of the operators, who reported that they had been unable to reach an agreement despite their efforts since March 31, when negotiations began. A hearing on the dispute was set for Aug. 22 in Washington, D. C.

Accepting the board's order, union representatives urged members to continue maximum production, pointed out that the long negotiations had not resulted in any losses for the miners and promised a strong defense of their demands.

While agreement had been reached on many matters, inability to come to a conclusion on wages was the deciding factor in the operators' turning to WLB. As W. W. Inglis, anthracite spokesman, expressed it, "we have never been in favor of taking our troubles to others for settlement, preferring to iron out all difficulties directly with the U.M.W., but because of circumstances we could do no other than go before the WLB."

Operators Offer 64c.

The operators, he declared, "have offered the mine workers the largest wage increase they believe would be approved by the federal agencies charged with wartime jurisdiction over wages and prices. This offer, which includes pay for safety lamps, tools, vacation and overtime, would have given the miners a total increase of 64c. a man a day—a figure which represents a much larger increase than was allowed to the soft-coal miners by the WLB directive of June 18, which established a limit of approximately 25c. per day. The United Mine Workers, however, refused to negotiate an anthracite contract below an over-all figure of \$1.30 per day."

The miners' demand for an over-all wage hike of \$1.30, leaving \$1 net after tool, lamp, smithing, vacation and other payments, was represented as justified under the national wage stabilization policy by Thomas Kennedy, secretary, who spoke for the miners at the Aug. 23 hearing. The increase, he declared, is "necessary to compensate for the hazards of the industry, to bring about comparable wages with other industries, to compensate for the lag and deficiency in wages over the past two years, to build for higher morale, increased productive efficiency and cooperation, and to aid in the more effective prosecution of the war."

John L. Lewis, U.M.W. president, followed Kennedy with a bitter denunciation of the anthracite operators and the railroad and financial interests which, he asserted, control them and demand "all the traffic will bear." Warning that the country faces a production crisis similar to that of Great Britain, he said that to avoid it the union's wage demands must be granted to enable the miners to purchase sufficient food to fulfill their production responsibilities.

Pointing to increases in hourly rates and

take-home pay as a result of steadier work and overtime, the operators maintained that no increases were due either for portal-to-portal or under the Little Steel formula. In fact, they contended, the operators already were paying for travel time through a differential for the same work when performed underground as compared with performance on the surface. Furthermore, in 40 years of contract making, the

portal-to-portal question had been seriously pressed only in the present negotiations.

The hearings brought out a suggestion for solving the question of travel pay by William H. Davis, WLB chairman. He intimated that the solution might lie in timing the working day from arrival at the mine in the morning and departure in the evening, rather than by a separate formula for underground travel time.

Ickes Asks Release of Miners From Service; WMC Tightens Control Over Manpower

WHILE the War Manpower Commission initiated steps to draft fathers and at the same time revised its list of critical occupations and established new standards for permitting the transfer of civilian workers from job to job, Coal Mines Administrator Ickes asked in August that WMC release men from the army to build up coal production in the anthracite region and the Pacific Northwest. Meanwhile, the army was returning some 4,500 miners to the metal operations, while shortages of men in the Colorado and Utah coal fields brought announcements from district WMC and USES offices that the Middle West and East were being checked for miners who could transfer to these and other western regions.

Reclassification of 18- to 37-year-old fathers with children born before Sept. 15, 1942, was announced by WMC Aug. 3, with drafting scheduled to begin Oct. 1. As the month wore on, WMC altered its position to the point where it agreed that in the initial stages of drafting fathers, only those in non-deferable occupations would be taken.

A series of changes in rules for inducting men was announced Aug. 14 by WMC. The new program, it was stated, would have major effect in deciding which fathers and which workers would be inducted first. The steps being taken by WMC were summarized as follows:

"1. Establishment of a list of critical occupations covering skills urgently needed in the war effort. Workers possessing such skills must get into war industry or supporting civilian activities by Oct. 1 or lose further claim to Selective Service occupational deferment (Local Board Memorandum No. 115A). In order to insure most accurate channeling of workers with those critical skills to the most urgent war jobs, provision is made for their hiring only upon referral by or consent of the U. S. Employment Service (Regulation 7).

"2. Selective Service local boards were instructed to give greater consideration than ever before to occupational deferment. In determining the 'replaceability' of a worker the boards are instructed to consider the actual and immediate effect of his induction on vital production. They are to take into account not merely the national shortage of his skill but available replacements for even unskilled workers and current local shortages of skilled and unskilled labor. Closer collaboration is provided between the local Selective Service boards and the offices of the U. S. Employment Service in making these deter-

minations (Local Board Memorandum No. 115).

"3. Establishment of new standards for permitting the transfer of civilian workers from job to job. These standards are based on experience under employment stabilization plans and will be written into all such plans by Oct. 15. They are intended to stimulate transfer from less essential to more essential war jobs and to reduce unnecessary shifting of workers from job to job, which has pyramidized turnover and interfered with vital production in many plants (Regulation 7). At the same time, broad powers to determine when a transfer is in the interest of the war effort are given to local and regional WMC offices (Regulations 4 and 7).

"4. Extension of the list of non-deferable activities and occupations, providing that all men of military age must transfer from such jobs or be placed first on the list for induction by local draft boards. This will insure that the first fathers to be drafted will be those who are contributing least to the war effort (Local Board Memorandum No. 181)."

To provide for accurate channeling of critical skills to the most urgent jobs, the new regulations provide that men in a new list of 149 critical occupations cannot be hired solely on presentation of a certificate of availability. "Referral by" or "consent of" the U.S.E.S. is necessary. To control migration, referral also is necessary in the cases of workers who have not lived or worked in the locality in the preceding 30-days period.

Its list of essential activities, with amendments, was reissued by WMC Aug. 17. Coal mining appears as follows (no material change):

"9. Coal Mining: The mining of anthracite, bituminous and semi-anthracite coal, lignite and peat, and the operation of breakers or preparation plants; includes also removing overburden and other such activities preparatory to coal mining operations."

Coal Mines Administrator Ickes took up the cudgels for the anthracite industry and bituminous producers in the Pacific Northwest last month. Formal announcement of this step was made by Mr. Ickes Aug. 13. With the release of a telegram to the Vermont State Coal Committee, he announced that he had requested WMC to obtain the release of miners from the services to increase not only anthracite production but also production for the Pacific Northwest. The Vermonters' telegram read:

"Two hundred representatives called

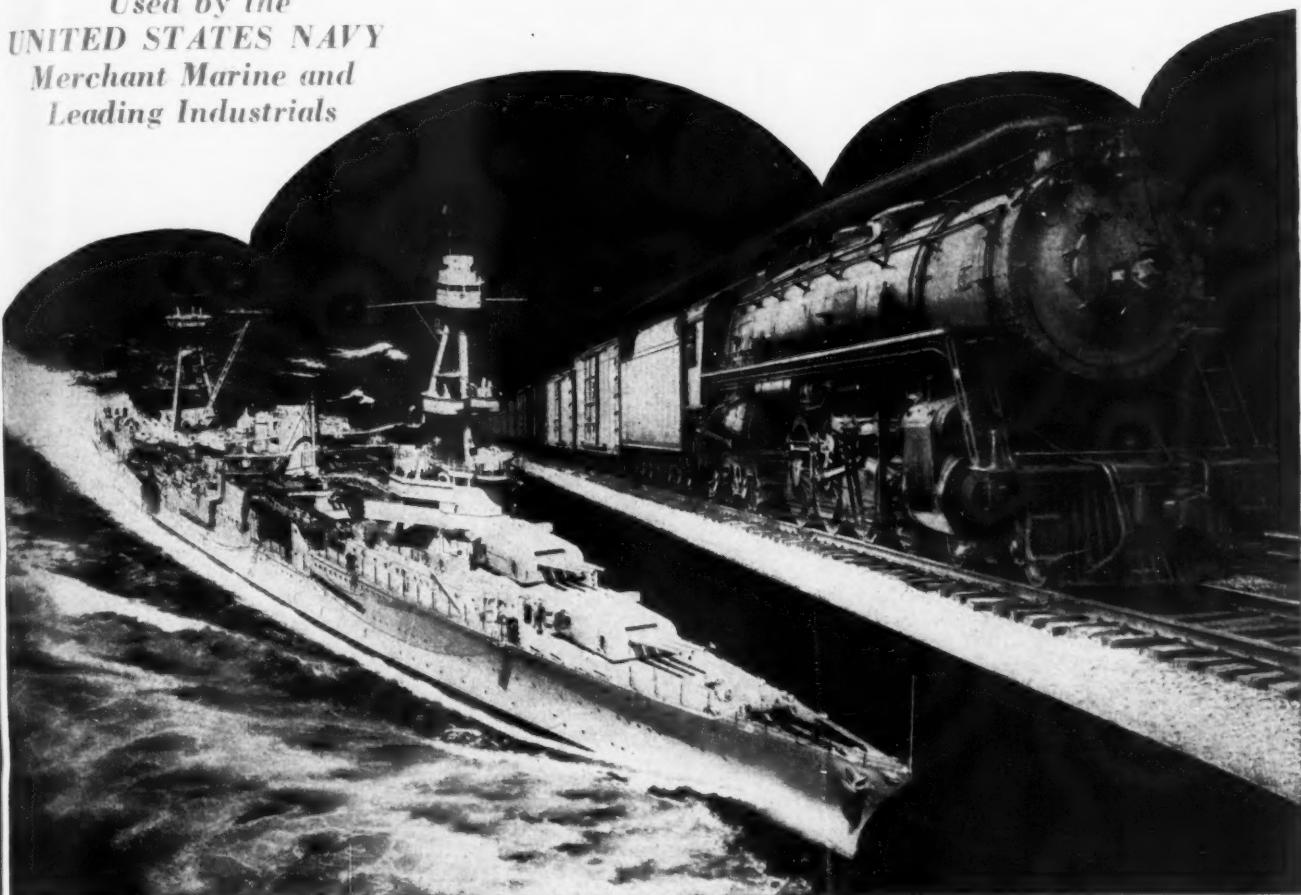
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here today by Governor Wills from nearly every town in Vermont to discuss coal situation voted to address you to emphasize precarious predicament Vermonters face unless every anthracite miner maintains absolutely continuous production for next nine months. We urge strongly every means be taken, including release of miners from armed forces. Also, increase price of coal to operators. Urge more stringent penalties to avoid absenteeism."

Administrator Ickes replied as follows:

"Your telegram received Aug. 4. I have made a formal request to the WMC for release of miners from the armed forces as a means of increasing anthracite production.

"I have no powers to impose penalties for absenteeism, and even if I had them I would strongly doubt the wisdom of attempting to use them to increase production in the present circumstances. I am convinced that threats of penalties would result in the production of less coal, not more coal.

"The mines are now being operated under government possession and control. Representatives of both the operators and mine workers are cooperating with me in the objective of achieving maximum possible production of coal in the present difficult circumstances arising out of the lack of a work contract between operators and mine workers, with consequent bitterness and confusion throughout the coal mining industry. Anthracite production, although still far from adequate, is steadily creeping upward.

"There are certain powerful factors affecting production which are not within my jurisdiction. These include not only manpower shortages but price ceilings and wage agreements. Your request that maximum prices be increased to stimulate production is a matter that must be decided by others, including the OPA and the Office of Economic Stabilization, under the 'hold-the-line' policy to curb inflation. I cannot foretell what would be the effect upon production of the above-mentioned circumstances if no wage agreement that is acceptable to the WLB is executed by the time the Coal Mines Administration acts under the Smith-Connally anti-strike act, to return mines to their owners.

"I am doing everything that I can within my limited authority to increase the production of coal, but you must realize that grave problems are involved over which I have no control."

Anthracite Loses Manpower

Information derived from a survey of anthracite manpower by WMC and the twelve regional U.S.E.S. offices for J. J. Forbes, regional manager, and Solid Fuels Administrator Ickes, was reported to be back of the latter's decision to ask for release of miners for the hard-coal field. The survey, among other things, disclosed that the anthracite industry lost 14,202 workers in the 18 months between Jan. 1, 1942, and July 1, 1943. Employment as of Jan. 1, 1942 was 90,343. By July 1, 1943, it had dropped to 76,141.

This factor alone—without taking into consideration the tonnage loss of several shutdowns because of failure of wage negotiations—was thought to be largely responsible for the plight of an industry

COMPARATIVE EMPLOYMENT STATISTICS IN ANTHRACITE

Field	En.	Employment listed to 37	Jan. 1, 1942	Jan. 1, 1943	or In-	Age	Number
Northern . . .	52,532	41,492	5,343	14,771	ducted	18	
Eastern Middle . . .	9,643	8,807	805	4,231	Group		
Western Middle . . .	17,006	13,929	2,897	4,660			
Southern . . .	11,162	11,913	1,956	5,758			
Totals . . .	90,343	76,141	11,001	29,420			

expected to produce 36,300,000 tons in the last half of 1943 with fewer workers than were available to mine 28,724,105 tons in the first half.

The WMC survey showed that enlistments and inductions alone had lifted 11,001 mine workers out of the industry and that unless an immediate blanket deferment is given mine workers many of the remaining 29,420 in the 18- to 37-year group are subject to induction. The fact that nearly 30 percent of the remaining mine workers are under 38 came as a surprise to officials in charge of the survey because of the generally accepted belief that mining was becoming an industry employing only older men.

Besides the services, war plants paying big wages, providing the men like to work overtime, have lured many miners away from their jobs.

Two of the four fields comprising the anthracite region have been especially hard hit. One is the northern, including parts of Luzerne, Lackawanna, Susquehanna and Wayne counties. On July 1, 1943, this field had only 41,992 workers, as compared with 52,532 on Jan. 1, 1942. The western middle field, comprising parts of

Northumberland, Columbia and Schuylkill counties, had 13,929 men on July 1, 1943, against 17,006 on Jan. 1, 1942. The eastern middle field (parts of Luzerne, Carbon, Schuylkill and Columbia counties) showed a slight decline from 9,643 men on Jan. 1, 1942, to 8,807 on July 1, 1943. The only gain was marked up in the southern field (parts of Dauphin, Schuylkill and Carbon counties), this from 11,162 on Jan. 1, 1942, to 11,913 on July 1, 1943.

In the light of these figures, grave doubt was expressed that the industry would be able to reach the 1943 production goal of 65,000,000 tons without blanket deferment of mine workers, plus a longer working week, release of men from the services and, possibly, an order returning ex-miners from war plants to the mines. The longer work week was approved by WLB and the President Aug. 16 (see story elsewhere in this news section) and a few days earlier Secretary Ickes requested return of miners from the army.

A precedent for release of coal miners was supplied by developments in the metal-mining field in August. The army started placing 4,500 skilled miners in the enlisted reserve Aug. 12, these men to go to metal mines where they would have the greatest opportunity to produce. Under their status as enlisted reservists, they must stay on the job and produce or be taken back into the army. Thus, they are unable to drift away into other industries, as did many of the 4,000 men released in the fall of 1942. On Aug. 18, WMC announced that releases had reached a total of 627. Those released will go into copper, zinc and molybdenum properties.

Lake and Metallurgical Coal Given Preference; Anthracite Deliveries Cut to 90 Percent

WITH the production rate for both anthracite and bituminous coal, although improving, still under that of the pre-strike period, further steps to insure equitable distribution and meet critical needs for both hard and soft coal were taken in August. New committees were set up to deal with the problem, deliveries to hard-coal retailers were limited to 90 percent of their usual takings, deliveries from Upper Lake docks were restricted, Appalachian producers were directed to give preference to orders for metallurgical coal and Lakes shipments, and a system of priorities was proposed to govern future coal distribution.

Meanwhile, government agencies, producers, wholesalers, retailers, the radio, the press and other agencies continued their campaign to get consumers to place orders now, and thus get the best possible flexibility in delivery arrangements. Consumers, particularly householders, were being requested to take other sizes where the ones they regularly order are temporarily short. A corollary campaign was addressed to economy in fuel use, weatherproofing and "winterizing."

Limitation of anthracite dealers to 90 percent of their requirements in the last coal year was announced by Solid Fuels Administrator Ickes Aug. 12. This step

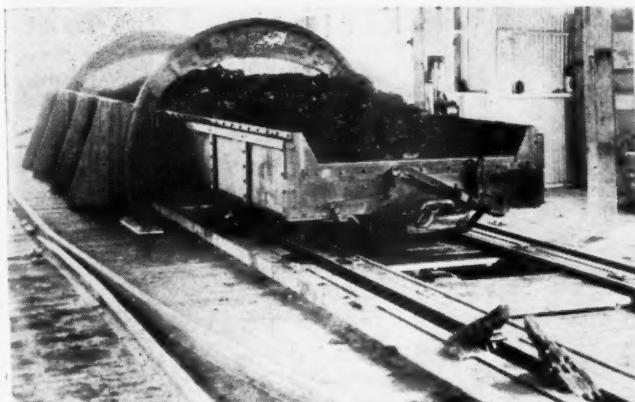
was taken, Mr. Ickes declared, because of a loss of 3,500,000 tons of production during the first half of the year as a result of many strikes.

The limitation on supplies to dealers was supplemented by institution of a priorities system for deliveries of domestic sizes of anthracite in twelve eastern states and the District of Columbia. Put into effect Sept. 1 by OPA through Ration Order 19, which was authorized by WPB at the instance of the Solid Fuels Administration, the regulation prohibits consumers from purchasing "at this time" more than 50 percent of the hard coal used during the base year April 1, 1942-March 31, 1943. Dealers are required to fill orders first from consumers having on hand less than one-fourth the base-year supply; next consumers having on hand more than one-fourth but less than one-half the base supply. Industrial users are exempt.

A new regulation to replace Solid Fuels Regulation No. 2 was reported in preparation, along with a proposal that Nos. 1 and 2 buckwheat be included in the 90-percent group with the domestic and pea sizes. It also was reported that equipped dealers would be required to use the 90-percent figure in serving unequipped dealers with whom they did business last year. A procedure also was being worked out

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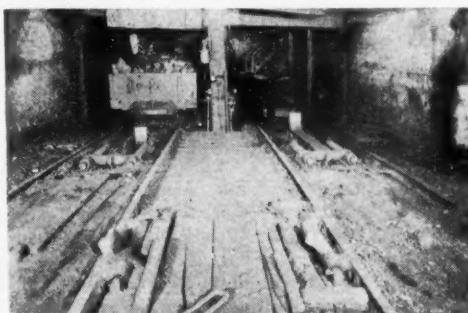
Patented features of Nolan Rotary Car Dumpers assure wide factors in safety, speed and economy of operation, with rugged materials and construction assuring long life at low maintenance costs.

One of the many special features of Nolan Rotary Car Dumpers is the use of Automatic Contactors and Time Relays so that only one limit switch is required on the Dumping Rings. Nolan Rotary Car Dumpers answer every demand for solid body, large capacity mine car service.

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The Nolan Patented Automatic Bumper Stop Cager was developed to automatically and rapidly handle mine cars to hoisting cages without damage to car wheels, journals and axles. Cars are stopped by engagement with the car bumpers which are designed for just this type of service. For rapid gravity caging, heavy grades are necessary so that the car caged, enters with sufficient force

to push the empty from the cage and to assume its position for hoisting with a minimum time lag. To cushion the shock of this rapid handling, use Nolan Bumper Stop Cages. They have proved their ability in the heaviest service.

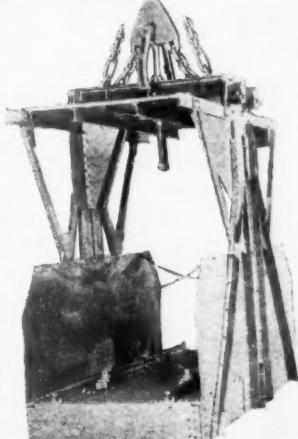


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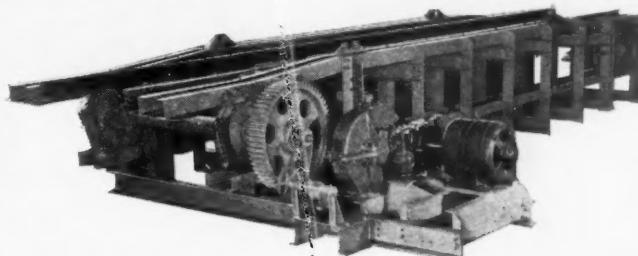


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These Feeders are built with extremely heavy frame, shafts, sprockets and gearing and with specially constructed heat treated chains and dogs.

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duction is increased and labor reduced to a minimum. Nolan cagers are built with steel base allowing quick installation, and with cover plates protecting all moving parts. Cushioned Horn Type Cagers are built in single and double horn models cushioned with very large compression springs.

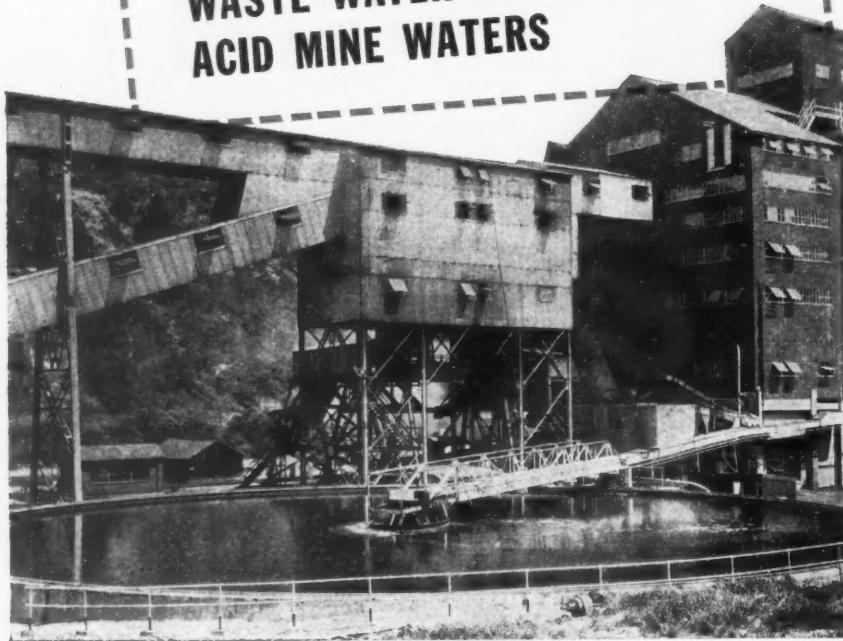
Nolan Side-Tip Gravity Dump

The Nolan Side-Tip Gravity Dump is designed for dumping all types of mine cars uncoupled. Dump is arranged for full automatic, semi-automatic or hand brake operation. The Nolan Automatic Dump is controlled by a double acting hydraulic cylinder which allows the dump to turn nearly 180 degrees and assures clean dumping. Five to seven cars a minute may readily be dumped.



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COMING MEETINGS

- National Safety Council: 32d congress and exposition, Oct. 5-7, Hotel Sherman, Chicago.
- Coal Producers' Association of Illinois: annual meeting, Oct. 12, Springfield, Ill.
- New River Coal Operators' Association: annual meeting, Oct. 14, Mt. Hope, W. Va.
- National Coal Association: annual convention, Oct. 14 and 15, Cleveland Hotel, Cleveland, Ohio.
- American Institute of Mining and Metallurgical Engineers and American Society of Mechanical Engineers: joint fuels conference, Oct. 28 and 29, William Penn Hotel, Pittsburgh, Pa.

whereby producers and wholesalers whose normal supply of anthracite is insufficient to meet the 90-percent portion of the normal requirements of their customers could obtain additional tonnage.

Completion of the anthracite distribution and advisory organization was announced in August. It comprises the necessary directive heads in the Solid Fuels Administration and national and regional committees. The latter comprise producer, wholesaler and retailer members. The line-up is as follows:

Solid Fuels Administration—Harold L. Ickes, administrator; Howard A. Gray, deputy.

S.F.A. distribution section—Dr. Charles Potter, head; Charles Hayes, assistant; chief of anthracite distribution, R. F. Duemler; bituminous, W. F. Hahman; conversions, A. W. Thorsen.

National Anthracite Distribution Committee—producers: Gordon C. Cooke, Delaware, Lackawanna & Western Coal Co., New York; Walter L. Banta, Lehigh Navigation Coal Co., Philadelphia; and Robert L. Birtley, Hammond Coal Co., Girardville, Pa.; wholesalers: Louis Gulotta, Louis Gulotta & Co., Inc., New York, and G. N. Snider, Dickson Coal Co., New York; dealers: Everett Robbie, Robbie Fuel Co., Quincy, Mass.; John Schriber, Eastern States Retail Solid Fuel Conference, New York; and Hugh O. Tompkins, Fuel Merchants' Association of New Jersey, Newark, N. J.

Regional Committee A (Westchester, Nassau and Suffolk counties, New York, and New York City, excluding Richmond County), with headquarters in New York—A. E. Sloat, Lehigh Valley Coal Sales Co., chairman.

B (New York State, excepting territories covered by Committees B and C), Syracuse, N. Y.—C. W. Stone, Susquehanna Collieries Co.

C (New Jersey and Richmond County, New York), New York—C. A. Blagg, Pattison & Bowns, Inc.

D (Pennsylvania), Philadelphia—Joseph Berta, Philadelphia & Reading Coal & Iron Co.



TOUGH CUSTOMERS— for the toughest mining jobs

It takes *men* today to keep urgently-needed coal pouring from the mines of America—and it takes equipment of equal caliber, too! Edison Electric Cap Lamps and M.S.A. Comfo protective caps are at the top of the list for hard-wearing stamina and durability—matching in capacity the severest demands of mining service.

The tough steel construction of the famous

Edison Alkaline battery has unrivaled ability to meet hard knocks. The strong laminated bakelite construction of the M.S.A. Comfo Cap gives solid protection against head hazards without deterioration from exposure to mine water, grease and perspiration. *This time-proved safety team is doing a vital job today—more necessary and more appreciated than ever before.*



For outstanding production achievement . . . the Maritime "M" Pennant and Victory Fleet Flag, awarded to M.S.A. by the U.S. Maritime Commission.

EDISON ELECTRIC
CAP LAMPS



M.S.A. COMFO CAPS

MINE SAFETY APPLIANCES COMPANY
BRADDOCK, THOMAS and MEADE STS., PITTSBURGH, PA.

District Representatives in Principal Cities

IN CANADA

MINE SAFETY APPLIANCES COMPANY OF CANADA, LIMITED
TORONTO . . . MONTREAL . . . CALGARY . . . NEW GLASGOW, N.S.

THIS VALUABLE BOOK

To save you time when specifying,
requisitioning or buying equipment,
materials and supplies

Free.

Keep important buying data at your finger-tips in this useful, compact form.

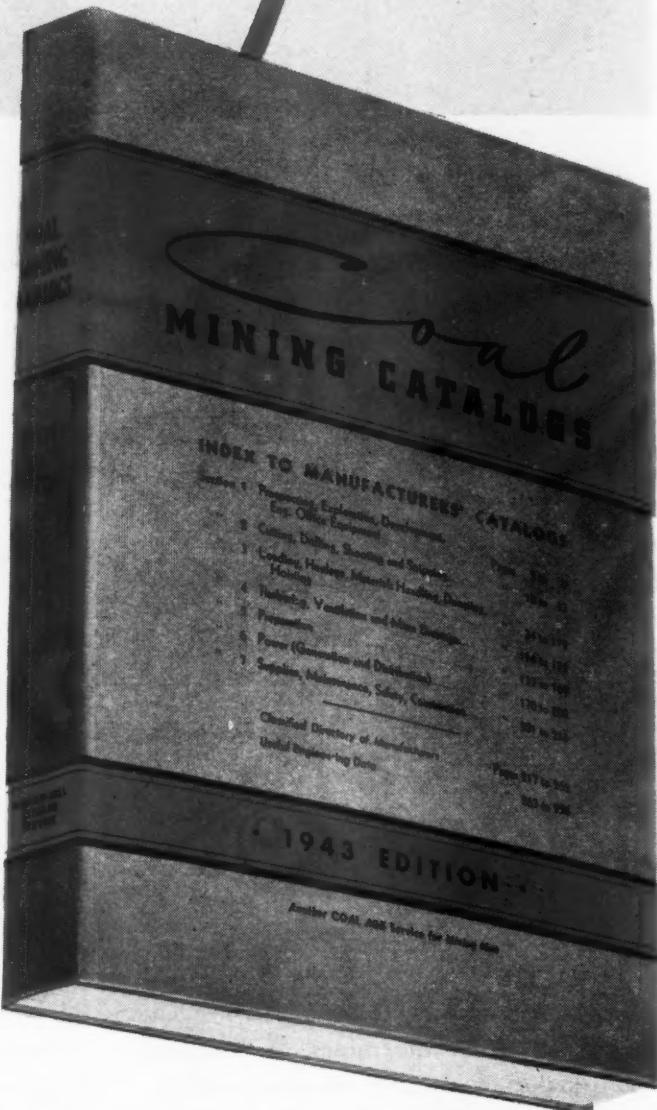
Better than ever! The 1943 Coal Mining Catalogs — a condensed source of the information you need to find quickly in these days when time is so precious.

Completely indexed catalog data of 141 leading manufacturers in handy compact form!

Classified Directory of Manufacturers lists the principal makers of equipment, machinery and supplies, classifying them by product!

Useful engineering, operating and buying data in 96 handy tables. You'll find every-day use for this helpful section!

Now, when mining and preparation of coal are under war-time pressure, this ready reference book will give you the kind of buying information you need when you need it!



If you are responsible for specifying, requisitioning or buying at your property, and do not have access to a copy, write us on your letterhead or mail the coupon for the 1943 Coal Mining Catalogs!

New!
1943 EDITION READY
FOR YOU-NOW . . .

MAIL
THIS
COUPON
TODAY

C.A., Sept., '43

COAL MINING CATALOGS, 330 W. 42nd St., New York 18, N.Y.

Gentlemen: I am responsible for specifying, requisitioning or buying equipment and supplies needed at our property, and do not have access to COAL MINING CATALOGS. Please forward me a copy of the 1943 Edition immediately. (If my country imposes a duty on such Catalog books, I agree to pay same.)

Name Title

Company Name

City Address State

The nature of our operation is

E (New England), Boston—Robert Gilmore, General Coal Co.

F (Delaware, Maryland, District of Columbia), Philadelphia—Frank G. Frey, M. A. Hanna Co.

While straight-through rationing of bituminous coal was still thought unnecessary and to be used as only a last resort in the opinion of such men as Donald M. Nelson, chairman of the War Production Board, priorities and allocation came sharply to the fore in August. This resulted from growing tight spots in lake shipments and supplies to steel plants and other metallurgical-coal users. Growing demands for coal for other purposes also resulted in continuance of tight situations in certain other regions, and led some producers to institute a rule that orders

Keeping Step With Coal Demand

Bituminous Coal Stocks

	Thou-sands	Net Tons	P.C. Change	Tons From July 1	From June 1	July 1	1943	1943	1942
Electric power utili-ties	18,821	—	5.9	+11.5					
Byproduct coke ovens	7,141	—	22.5	-27.6					
Steel and rolling mills	962	—	13.1	-15.9					
Railroads (Class 1) ..	11,964	—	11.2	-2.1					
Other industrials* ...	28,290	—	1.3	+10.6					
Total	67,178	—	7.3	+2.3					

Bituminous Coal Consumption

	Thou-sands	Net Tons	P.C. Change	Tons From June 1943	From May 1943	June 1942
Electric power utili-ties	6,023	—	9.5	+16.4		
Byproduct coke ovens	7,176	—	6.4	-0.7		
Steel and rolling mills	824	—	6.0	+7.8		
Railroads (Class 1) ..	9,855	—	8.3	+10.5		
Other industrials* ...	11,391	—	10.0	+13.0		
Total	35,271	—	5.8	+16.0		

* Includes beehive ovens, coal-gas retorts and cement mills.

Coal Production

	Bituminous
Month of July, 1943, net tons	52,540,000
P.C. change from July, 1942	+9.8
January-July, 1943, net tons	337,434,000

P.C. change from Jan.-July, 1942

+1.3

Anthracite

	Anthracite
Month of July, 1943, net tons	5,668,000
P.C. change from July, 1942	+5.5
January-July, 1943, net tons	34,839,000

P.C. change from Jan.-July, 1942

-0.6

Sales of Domestic Stokers vs. Oil Burners

	Coal	Oil
	Stokers	Burners
June, 1943	2,106	1,166
P.C. change from June, 1942	-81.5	-44.4
January-June, 1943	11,818	8,951
P.C. change from Jan.-June, 1942	-76.7	-77.3

Index to Business Activity*

Week ended Aug. 20	211.3
P.C. change from month earlier	+ 0.05
P.C. change from year earlier	+13.2

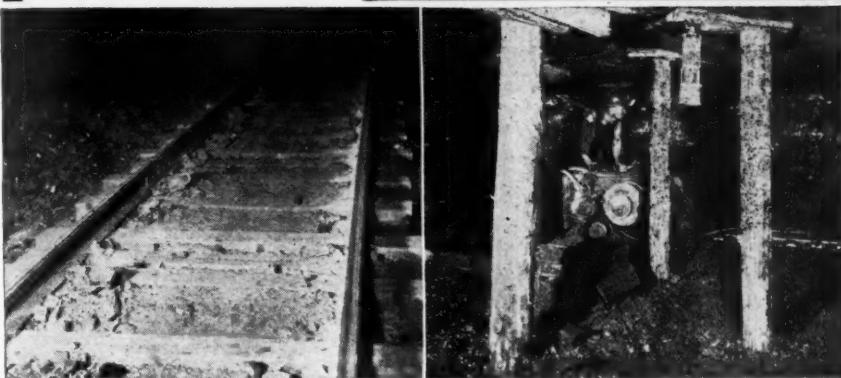
* *Business Week*, Aug. 27.

Electric Power Output†

Week ended Aug. 27, kw.-hr.	4,264,524,000
P.C. change from month earlier	+ 1.6
P.C. change from year earlier	+16.1

† Edison Electric Institute.

Do your Mine timbers DIE YOUNG?



(Left) Osmose-treated oak ties in haulage way of Clover Fork Coal Co. Mine, Kitts, Ky. (Right) Posts,

HERE'S HOW

Osmose-Treated Mine Ties and Timbers cut maintenance and replacement costs

Mining companies throughout the country are using Osmose-treated ties and timbers because they have a service life *three to five times longer than untreated timbers!*

Easy to apply by dipping or brushing, OSMOSALTS penetrate into the wood . . . forming a deep zone of protection that resists wood decay and prevents rot.

Osmose-treated timbers keep their original strength and provide additional safety by helping to prevent serious, costly accidents that often result from untreated decaying timbers.

Let one of our field engineers help you with your wood-preserving problems. Write for Bulletin 143-C now!

Why
OSMOSE

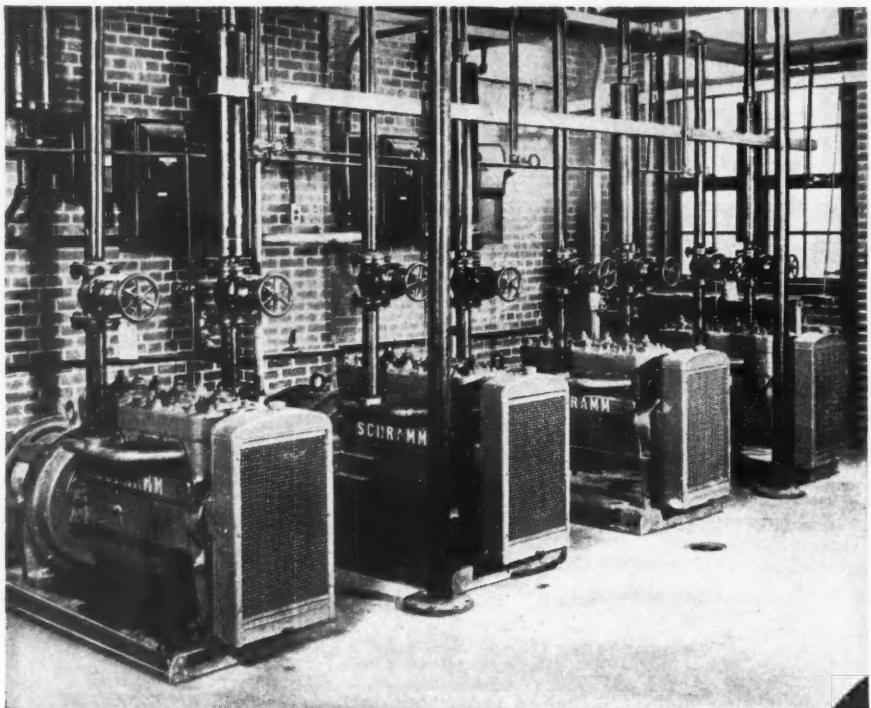
PROTECTION PAYS

1. APPLICABLE to fresh cut native timber locally obtained and treated thus eliminating or reducing transportation costs to minimum.
2. PENETRATES deeply into the timber providing 3 to 5 times longer service life over untreated wood.
3. ECONOMICAL. No capital investment in treating equipment required. Eliminates costly transportation to and from mechanical pressure-treating plants.
4. EASY TO APPLY by brushing or dipping with unskilled labor. No special expensive equipment necessary.

OSMOSE WOOD PRESERVING COMPANY

OF AMERICA INCORPORATED

General Offices: Buffalo, N. Y.—Branch Offices: Birmingham, Ala.; Denver, Colo.; Harlan, Ky.; Kenova, W. Va.



Lots of Power...

BUT EASY TO HANDLE!

Here's four of a battery of #210 cu. ft. actual air Schramm Compressors, operating as a unit system for a large industrial plant. They're taking care of the variable maximum and minimum load, automatically, 24 hours a day—with minimum attention!

Schramm was specified because it provides heavy-duty, continuous operation with least attention, upkeep and operating costs.

Schramm Air Compressors are available with various types belt drives, as well as built-in motor drive and direct connected diesel or gasoline engines. Each unit is lightweight, compact, with capacities up to 600 cu. ft. displacement.

Long-life features of Schramm include: mechanical intake valve . . . vertical piston travel and horizontal valve action . . . sturdy support for cylinder head . . . and forced feed lubrication.

Other Schramm features are likewise outstanding. Write today for complete details in Catalog 42-S.

SCHRAMM INC

THE COMPRESSOR PEOPLE
WEST CHESTER
PENNSYLVANIA

would be accepted from dealers and other consumers only for the same number of cars of each kind and size of coal as was shipped in corresponding periods last season, subject to any increases in production that might be achieved.

Despite these complications, the supply of bituminous coal was considered to be adequate to take care of needs, barring unforeseen stoppages or other difficulties, the major problem being that of distribution. To meet two emergency situations, Administrator Ickes, on Aug. 5, ordered 56,000 tons diverted from regular consignees to the Morgantown (W. Va.) Ordnance Works; Semet-Solvay Co., Ironton, Ohio; and the Donner Hanna Coke Corp., Buffalo, N. Y.; and, on Aug. 18, 13,500 tons to the Jones & Laughlin Steel Corp., Pittsburgh, Pa.

Group to Ascertain Needs

With a proposed priority plan for coal purchases in the offing, the Solid Fuels Advisory War Council tackled the problem of supplying critical areas and consumers in Washington Aug. 4. The immediate problems were shipments to the Great Lakes and supplies of metallurgical coal for certain byproduct coke plants, aside from the Pacific Northwest. A subcommittee consisting of Charles O'Neill, H. C. Rogers, John A. Maher, James L. Newbold and Porter C. Savage was appointed to ascertain the requirements for the two purposes stated and the possible sources of supply. The subcommittee concluded that the principal problems in the Appalachian field arise in the high-volatile regions, and recommended that all districts hold meetings immediately to see what could be done to solve them without the necessity of formal government orders or directives. The districts immediately proceeded with their conferences in preparation for submitting data to the Solid Fuels Administrator and to the Advisory Council, which scheduled another session for Aug. 18.

"We were assured," said the subcommittee and a number of district representatives in a letter to the industry dated Aug. 13, "that a method would be worked out by the Solid Fuels Administration for War to make legal shipments of coal for these special requirements, and thus give protection on contractual obligations. Whether this will take the form of a general directive or of individual directives in each case has not been determined."

The proposed plan of the Solid Fuels Administration for control of the sale and distribution of bituminous coal assigns preference ratings for various classes of consumers and, with some qualifications, provides that the highest preference rating must be accorded priority. Producers and wholesalers of coal would be prohibited from shipping coal by any method except in strict accordance with the regulation. Also, shipments would be prohibited unless the written order contained a certification that the producer or wholesaler is (or is not) the regular and continuous source of supply for the purchaser, plus a certification of the preference rating of the purchaser's order, or unless the producer or wholesaler has coal available for shipment and has no preference rated orders on hand.

BITUMINOUS CASUALTY CORPORATION

ROCK ISLAND ILLINOIS



FINANCIAL STATEMENT

JUNE 30, 1943

ASSETS

BONDS (Amortized Values):

United States Government.....	*\$7,322,236.72
Political Subdivisions of State.....	64,358.29
Railroad	105,449.88
Industrial	28,892.83

**\$ 7,520,937.72

STOCKS (Market Values):

Preferred—Railroad, Public Utility, Industrial and Miscellaneous.....	\$ 269,943.38
Common—Public Utility and Industrial.....	367,912.50

.....

TOTAL STOCKS	637,855.88
Investment in Bituminous Fire and Marine Insurance Company.....	347,830.20
Cash	1,555,102.67
Premiums in Course of Collection less than 90 days due.....	883,568.88
Accrued Interest on Bonds.....	26,291.62

\$10,971,586.97

TOTAL ADMITTED ASSETS

LIABILITIES

Reserve for Claims	\$ 5,283,647.72
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Reserve for Unearned Premiums:

100% Advance Deposits (Guarantee for Payment of Interim Earned Premiums)	\$1,490,700.69
Unearned Portion of Annual Payment Basis Premiums	807,626.49

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TOTAL UNEARNED PREMIUMS

Reserve for Unpaid Dividends.....	2,298,327.18
Reserve for Taxes and Reinsurance	15,194.81
Reserve for Commissions and Other Expenses	534,855.38
Other Liabilities	321,961.11
Reserve for Fluctuation in Market Value of Securities Owned (Excess of Market Value over Book Value of Stocks Owned)	2,895.70
Voluntary Contingency Reserve	54,769.78
	959,935.29

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TOTAL LIABILITIES

Capital	\$ 500,000.00
Surplus	1,000,000.00

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SURPLUS AS REGARDS POLICYHOLDERS.....

.....

TOTAL LIABILITIES, CAPITAL AND SURPLUS

.....

1,500,000.00

\$10,971,586.97

* United States Government Bonds carried at \$329,610.51 in the above statement are deposited as required by law.
** Market value of bonds \$163,376.46 in excess of above amortized value.

United States Government Bonds and Cash represent more than 80% of the Total Admitted Assets.

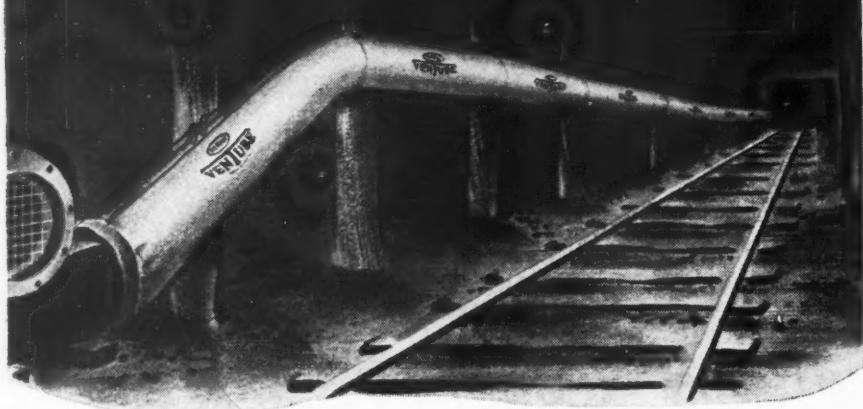
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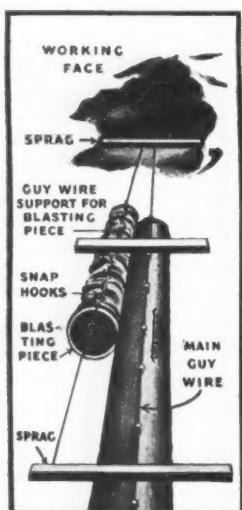
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HOW TO USE DU PONT "VENTUBE"*

for greater efficiency and faster production
at the working face



IMPORTANT NOTES ON THE "VENTUBE" BLASTING PIECE. Valuable now, more than ever before, is every means of faster, more economical coal production. Check these important helps on operating your "Ventube" system for peak efficiency. Write Du Pont for free reprints of previous advertisements in this informative series.



WHY USE THE "VENTUBE" BLASTING PIECE? In tunnel work, where the shots are heavy and "Ventube" is carried to within 10 or 15 feet of the breast, the tubing should be protected. This is accomplished by removal of the last 100-foot section before blasting. The "Ventube" blasting piece, suspended by its own guy wire, assures quick and easy withdrawal from and return to the face.

HOW TO INSTALL THE "VENTUBE" BLASTING PIECE—Mount a guy wire between two sprags—one at the face, the other about 120 feet back in the tunnel. (See illustration.) String the wire at a slight angle, so that the connection in the rear will be separated by about two feet from the main duct line. Mount the blasting piece on the wire, and couple to the main line in advanced position.

HOW TO OPERATE THE "VENTUBE" BLASTING PIECE—Before blasting, *shut off the blower*. Uncouple the blasting piece from main line and push back 100 feet from the breast. After the shot, return blasting piece to advanced position and recouple to main line. Turn blower on, and resume work.

• • •

Attached to blower of adequate air capacity and with permissible motor, "Ventube" sweeps the face with clean, fresh air. It helps remove dust and bad air—guards the health and steady efficiency of workers. "Ventube" is light and compact—easily portable—may be pushed back on itself quickly before blasting. Its sturdy fabric construction, coated and impregnated with a special abrasion-resistant compound, enables "Ventube" to resist heat, moisture, mildew, dry rot, acid and alkaline waters. E. I. du Pont de Nemours & Co. (Inc.), "Fabrikoid" Division, Fairfield, Connecticut.

*"VENTUBE" is Du Pont's registered trade mark for its flexible, rubberized ventilating duct.

NOTE: For the duration of the War, "Ventube" can be supplied only to the extent that raw materials for its manufacture are made available in accord with regulations issued by the War Production Board. But if you have adequate priority, write now for complete information on this valuable tool of mechanized production.

DU PONT
REG. U. S. PAT. OFF.

VENTUBE
REG. U. S. PAT. OFF.

BETTER THINGS FOR BETTER LIVING . . . THROUGH CHEMISTRY

Preference ratings would be established as follows:

1. Coke production and metallurgical purposes.

2. Coal for water-borne delivery, generation of electricity, smelting, gas manufacture, bunker fuel, raw material for chemical production, hatcheries, food baking.

3. Food production, distribution and preservation, including supplies for farms, public utility, communications and transportation services (except manufactured gas and electricity); sanitation, health, protective and allied services; mining, production and refining of all metallic and non-metallic minerals, including fuels; production, refining and distribution of petroleum and petroleum products; production and processing of chemicals; production and processing of semi-fabricated and fabricated parts; scientific testing and research laboratories; lumber and lumber products; inedible rendering industry.

4. Coal for retail dealers.

5. Other industries.

A purchaser who is not able to obtain coal from his regular and continuous source of supply, or any new consumer without such a supply, may file an application with the administration for designation of a source for the future. The proposed order also would provide that no person shall be held liable for damages or penalties for any default under any contract or order resulting directly or indirectly from compliance with the regulation.

Restrict Haul Beyond Lakes

While this plan remained in the "proposed" stage, action along its general lines was taken in two cases in August. In SFA Regulation No. 3, announced Aug. 21, shipments of coal from the Upper Lake Docks to areas beyond those normally served were halted Aug. 24. After that date, shipments of both anthracite and bituminous coal from docks on Lake Superior, the west bank of Lake Michigan and Green Bay are restricted to Michigan, Illinois, Wisconsin, Minnesota, Iowa, Nebraska, North and South Dakota and the Provinces of Ontario and Manitoba. For some time, it was explained, coal has been flowing from these docks to Washington, Oregon, Idaho, Montana and Wyoming, thereby reducing stocks available next winter for those states which depend upon lake movement for their supply. "Every effort is now being made to move coal up the Lakes to replenish these stocks before winter weather halts lake navigation."

Preferences for shipments from Appalachian producers to the Lakes and to metallurgical and other special-purpose users were put into effect by SFA Aug. 23. These preferences are established in SFA Regulation No. 4, the major sections being as follows:

"602.42. Commitments on Shipments for Metallurgical and Other Specified Special Purposes—Producers shall forthwith arrange their distribution schedules so that they ship or make adequate provision for shipping each month the tonnage of bituminous coal required to meet in full their monthly commitments to all purchasers using such coal, or reselling

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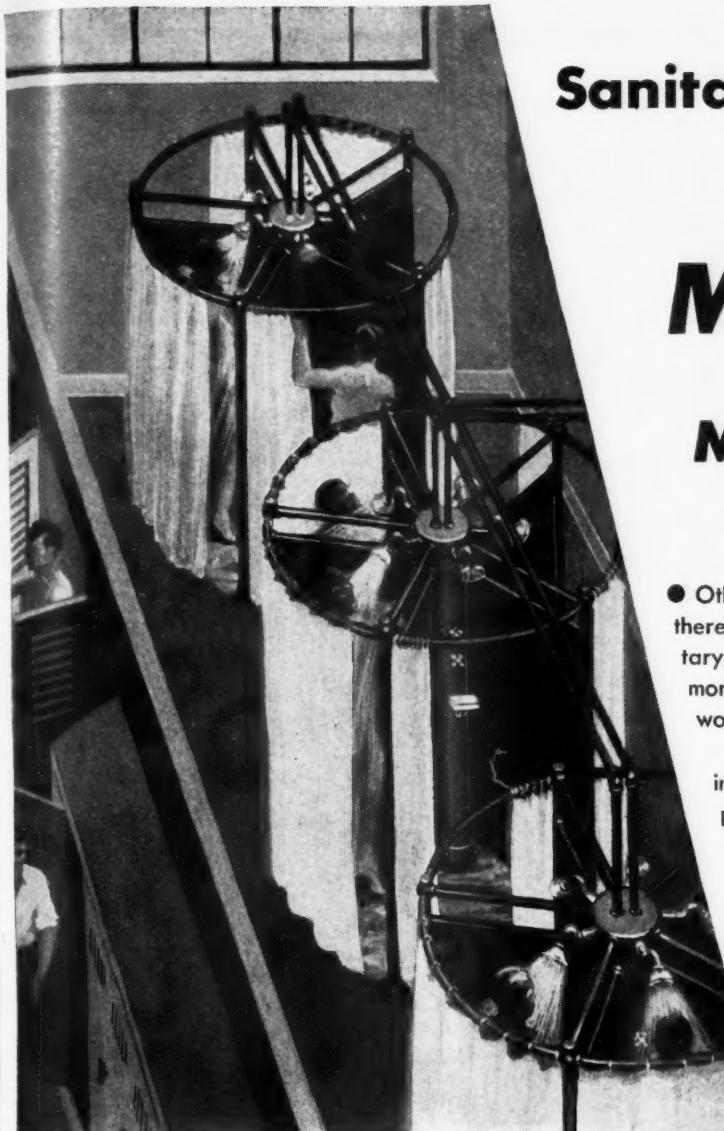
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COAL AGE



BRADLEY
multi-stall showers



Sanitary Shower Facilities

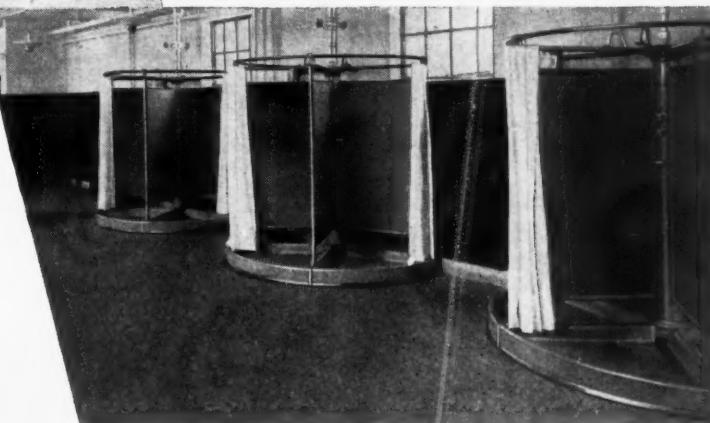
**KEEP
MEN FIT!**

•
**Multi-Stall Showers
Are the Answer**

- Other important industries—particularly those where there are dust, grime and grit,—have found that sanitary, convenient shower baths curb skin troubles, aid morale, improve health, and insure steady everyday work with a minimum of absenteeism.

Thousands of Bradley Multi-Stall Showers have been installed, being available in 5-stall units that reduce piping and piping connections by 80 per cent. For each five stalls, only one set of supply lines is needed, as against five sets needed for five conventional type shower stalls. Also being partially assembled, they are ready for quick installation.

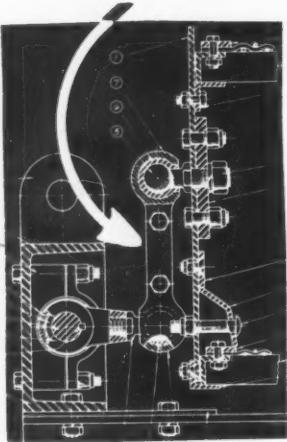
Assistance by our Washroom Engineers is offered. Write today for our Catalog 4308.... BRADLEY WASHFOUNTAIN CO., 2309 W. Michigan Street, Milwaukee 1, Wisconsin.



Above: Typical arrangement of Bradley 5-Stall Showers at one end of washroom.

At left: Typical installation of Bradley Washfountains—each serves 8 to 10 persons simultaneously with clean running water from central sprayhead. Water consumption reduced 70 per cent.

Here Vibration Is CONTROLLED



on
SECO
Vibrating
SCREENS

Bigger screen output for the preparation plant is assured by SECO equipment. Higher tonnage per square foot of screen, is the answer.

SECO gives it—with a positive eccentric true-circle throw motion—and with Controlled Vibration.

All of the screening surface is under the same control—so that every square foot of screen is working all the time.

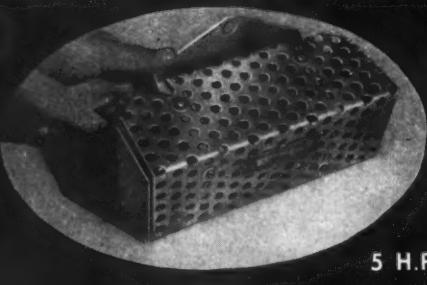
Write for Fully Descriptive Catalog.

SCREEN EQUIPMENT CO. Inc.
9 Lafayette Ave. Buffalo, N. Y.

AUTOMATIC D. C. MOTOR STARTER

G.M.C. CHOKE STARTERS

- * No Moving Parts
- * Line Starting
- * Stops Commutator Arcing
- * Voltage Drop Across Resistance High at Start Low at Running Speed
- * Low First Cost
- * Low Maintenance Cost
- * Ideal for Pump or Conveyor Motors
- * 1/2 H.P. to 25 H.P. Sizes



*Write
for details*

GUYAN MACHINERY CO.
LOGAN WEST VIRGINIA

such coal for use, in the manufacture of coke, for smelting purposes, in the manufacture of gas, as a raw material in the manufacture of chemicals, or for foundry, malleable or other metallurgical purposes. Producers are prohibited from shipping bituminous coal to any purchaser unless and until they have first shipped or made adequate provision for shipping the tonnage necessary to fulfill commitments pursuant to this section.

"602.43. Commitments on Lake Shipments—Producers shall forthwith arrange their distribution schedules so that, subject to compliance with Sec. 602.42 of this regulation, they ship or make adequate provision for shipping, in accordance so far as practicable with shipping instructions received from lake forwarders or purchasers, the balance of their available tonnage of bituminous coal to the extent required to meet in full on or before Nov. 15, 1943, all their commitments to ship bituminous coal, during the current season of lake navigation (1943), to lake forwarders and purchasers who receive such coal via lake. Producers are prohibited, except as provided in Sec. 602.42 of this regulation, from shipping bituminous coal to any purchaser unless or until they have first shipped or made adequate provision for shipping the tonnage necessary to fulfill commitments pursuant to this regulation.

"602.44. Commitments on All Other Shipments—Producers shall forthwith arrange their distribution schedules so that, after compliance with Secs. 602.42 and 602.43 of this regulation, the balance of their available tonnage of bituminous coal, if insufficient to meet all other commitments in full, is prorated on a uniform percentage basis among all other purchasers to whom they have commitments except (a) to the extent that such purchasers agree to receive less than such pro-rata share or (b) to the extent otherwise provided by amendments to this regulation or by directives issued pursuant to Secs. 602.51 and 602.58 of this regulation [covering additional governmental action and directions].

"602.45. Voluntary Efforts to Level Purchasers' Stocks—Purchasers and producers shall endeavor to agree to reduce pro-rata shipments pursuant to Sec. 602.44 of this regulation to those purchasers having on hand more than a reasonable number of days' supply of coal.

"602.46. Governmental Action Implementing Voluntary Efforts to Level Purchasers' Stocks—From time to time the Solid Fuels Administrator for War may implement this regulation so as to specify a reasonable number of days' supply of coal for various classes of purchasers and may when necessary or advisable prohibit or restrict shipments of coal to certain classes of consumers."

Order Affects Seven Districts

Producers to whom the order applies are those "engaged in the business of mining or preparing bituminous coal in Districts 1, 2, 3, 4, 6, 7, and 8, as described in the annex to the Bituminous Coal Act of 1937 (or the sales agent of any such person)."

The regulation also provides for con-



SABOTAGE!

The traitor tossing a monkey wrench into the machinery isn't the only kind of sabotage that slows down production.

More frequently, unseen saboteurs are at work — Sickness and Accidents, most of them preventable.

Last year alone these saboteurs robbed U. S. production of 400 MILLION MAN-DAYS! Enough to have outfitted with all munitions of war a striking force the size of that which we landed in Sicily!

Many leading coal mine operations now have a dependable group disability insurance plan on guard, making competent medical attention for Employees available when Accidents and Sickness strike, often restoring workers to the production lines with a minimum of lost time.

HUMAN SECURITY

- Death in family
- Death of the Employee
- Loss of time through Accident or Sickness
- Dismemberment

EMERGENCY INCOME

Such a Provident HUMAN SECURITY Plan of group disability protection benefits Employers and Employees alike by helping workers meet such disabling or income-robbing emergencies as



**Do Your Employees
Have Such
Complete Protection?**

PROVIDENT LIFE AND ACCIDENT INSURANCE COMPANY

Chattanooga, 2

Since 1887

Tennessee

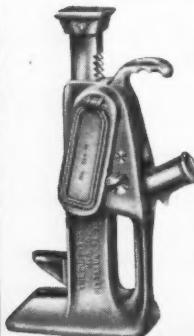
Protecting through HUMAN SECURITY Plans more than One Million U.S. Workers and their dependents.

DUFF-NORTON MINING JACKS

✓ HUSKY
✓ EASY OPERATING
✓ SAFE

From working face to tipple, count on Duff-Norton Jacks to provide dependable, efficient lifting, lowering, pushing, pulling—they're "mechanical muscles" that help keep production rolling.

You'll find Duff-Norton Jacks are husky enough for the toughest jobs, yet easy to spot under the load and easy to operate with positive safety.



Check the Complete Line of DUFF-NORTON MINING JACKS

The wide line of Duff-Norton Jacks means there's a Duff-Norton for every job! Catalog 201 gives the complete story. Write for your copy today!

**THE DUFF-NORTON
MANUFACTURING CO.
PITTSBURGH • PENNSYLVANIA**

Canadian Plant:
COATICOOK, QUEBEC

Representatives in Principal Cities

sultation between producers, lake operators and SFA on demand and supply, prohibits evasions, provides penalties and protects producers on contracts. The section covering the latter is as follows:

"602.54. Damages for Breach of Contract—No person shall be held liable for damages or penalties for any default under any contract or order which shall result directly or indirectly from compliance with this regulation."

James R. Sutphen Joins Coal Age Staff

Coal Age announces the appointment of James R. Sutphen, Teaneck, N. J., as assistant editor. Mr. Sutphen comes to the magazine from the Associated Press with a background of 15 years in newspaper work and politics. He will specialize in news and interpretive articles dealing with legislation and regulation, Washington developments, labor relations, public relations and economics.



James R. Sutphen

Mr. Sutphen was born in Holland, Mich., Nov. 15, 1908, moving to New Jersey when he was nine years old. He was educated at Lawrenceville Academy, Lawrenceville, N. J.; St. James School, Maryland; and Rutgers University, where he majored in journalism and was a member of Zeta Psi fraternity.

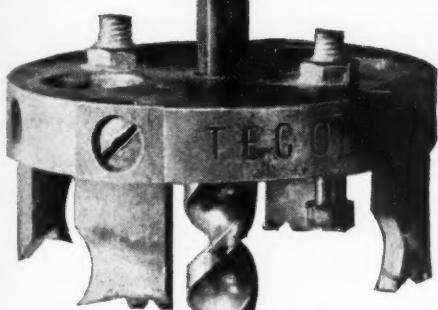
Graduating from Rutgers in 1929, Mr. Sutphen joined the staff of the Bergen (N. J.) Evening Record. He held the positions of sports editor, news reporter, telegraph editor and political editor until his resignation in 1938, when he accepted a position as secretary to Rep. Frank C. Osmers Jr., Ninth New Jersey District. With Mr. Sutphen serving as his campaign manager, Congressman Osmers was reelected in 1940, but enlisted in the army Dec. 8, 1941. Mr. Sutphen continued as his secretary until November, 1942, when he became news editor of the Newark (N. J.) bureau of the Associated Press, from which he came to Coal Age.

Mr. Sutphen's career with the Bergen Evening Record included four years as its



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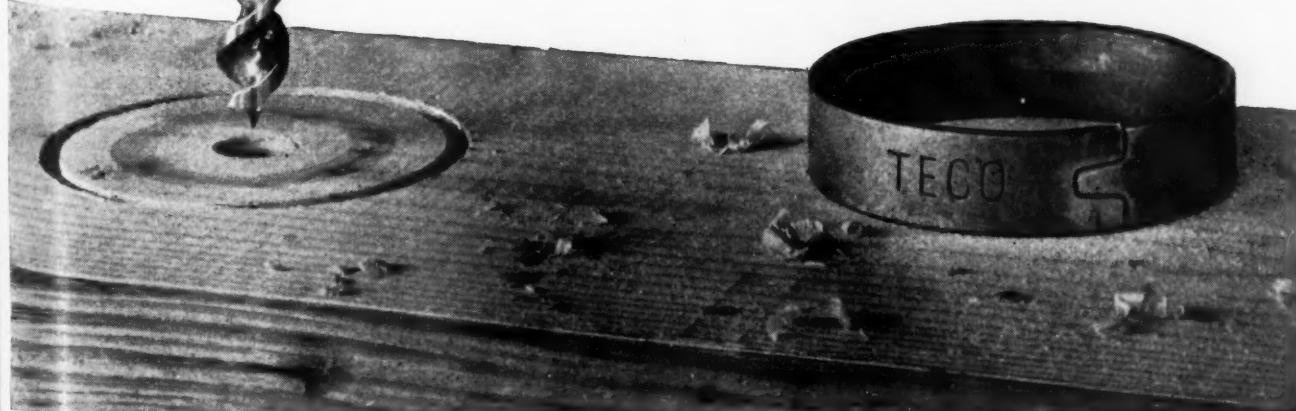
'Round the World—100,000 timber war and peace-time structures have been quickly and economically built with the TECO Timber Connector System of Construction—sponsored by the lumber industry since 1933.

The TECO Split-Ring Connector spreads the load on a timber joint over practically the entire cross-section of the wood . . . brings the full structural strength of lumber into play.

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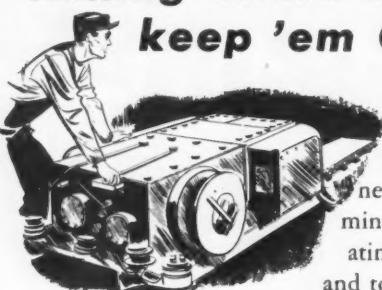
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Whitney Drive and Conveyor Chains have the extra toughness it takes to keep mining machinery operating at top capacity... and to keep down overall cost-per-ton. Likewise, every Whitney Part is dimensionally and physically correct, which means fewest replacements in the long run. Have you a personal copy of Whitney Catalog V-153? If not, write for it today.



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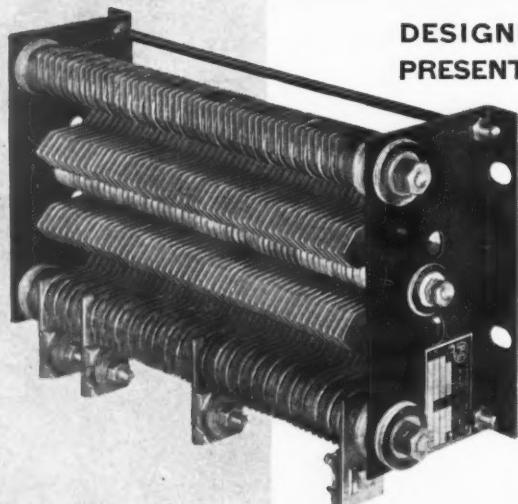


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legislative correspondent at Trenton and coverage of numerous investigations into New Jersey politics, as well as work on such stories as the Lindbergh kidnapping, the explosion of the dirigible Hindenburg and the burning of the Str. "Morro Castle" off Asbury Park. As a Congressional secretary, he spent most of the four years from 1939 through 1942 in the nation's capital working with various government departments and offices, as well as taking part in, and sometimes directing, political campaigns in New Jersey. During this period, he also was connected with the Hackensack (N. J.) public relations firm of Robert H. Gamble & Associates.

Coal Miners in Britain Given Service Status

Mining of coal in Great Britain was put on the same footing as service with the armed forces Aug. 23 when the Ministry of Labor announced that men of all ages registered for military duty might choose between coal mining and the services. In abolishing the age limit recognition has been accorded the seriousness of the manpower shortage in the mines. Heretofore men registered for military service might choose work in the mines or service in the army or navy when called up provided they were not more than 25 years old at the time of registration and did not possess special skills needed in the fighting forces.

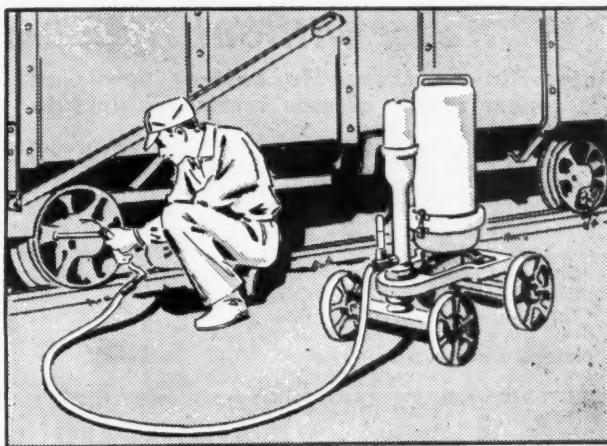
Illinois Spoil Leveling Law Challenged by Strippers

Fifteen strip coal operators, members of the Illinois Coal Strippers' Association, challenged in the Federal District Court at Springfield, Ill., on Aug. 5 the constitutionality of the new State law requiring, among other things, leveling of spoil banks (Coal Age, August, p. 149). Seeking a temporary order restraining the State from enforcing the act, which was signed July 31 by Governor Dwight Green, the operators alleged that the law is arbitrary, unreasonable and oppressive, and contended the expense of leveling spoil ridges would be "beyond any possible land values."

The operators won a round when Judge Charles G. Briggle granted the temporary order, setting Aug. 14 for a preliminary hearing. At this hearing, the State Attorney General offered no reply to the contentions of the operators nor did he make any objection when Judge Briggles set Sept. 15 for presentation of arguments before a three-judge panel.

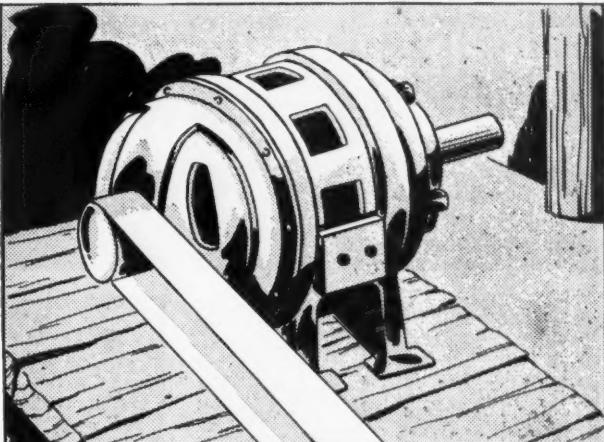
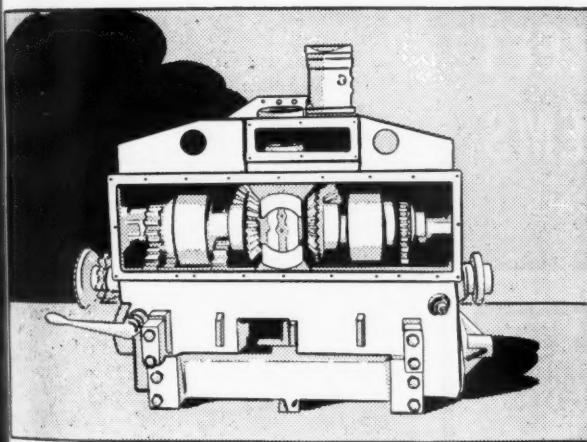
The plaintiff companies, who said they own or control 21,456 acres of unmined Illinois land, are: Central State Collieries, Inc.; Delta Coal Mining Co., Fairview Collieries Corp., Little John Coal Co., Inc.; Midland Electric Coal Corp., Midwest-Radiant Corp., Northern Illinois Coal Corp., Osage Coal Co., Pyramid Coal Corp., Sahara Coal Co., Bankston Creek Collieries Co., Southwestern Illinois Coal Corp., Truxa Traer Coal Co., United Electric Coal Cos. and Pioneer Coal Co.

How to get more tonnage in less time



ESTABLISH a regular schedule for lubricating the machines constantly in use and have this work done by as few men as possible. You will require a different schedule for machines that are operated 24 hours a day than when they are operated fewer hours.

2. **CHANGE** to improved lubricants and methods of application—methods that will require as few types of lubricants as possible, assure the lubricant getting to the bearings when needed and in good condition—free from dirt, dust, water, etc.



3. Do not depend on the gaskets or seals alone to keep gear housings tight. Housings distort with changes in temperature and with age, and often can only be made oil tight by refacing the mating surfaces of the housing itself.

4. **AVOID** breakdowns by checking motors regularly against entry of dirt and water. See that their ventilation is always unobstructed. Use Trojan M-2 for bearings if hand packed with grease. Pacemaker No. 2 or Penn-Pacemaker No. 2, if oil lubricated.

5. Let a Cities Service lubrication engineer make a survey of your equipment and operations, and recommend a special lubrication plan fitted to your particular needs. Write to your nearest Cities Service office for this assistance today.

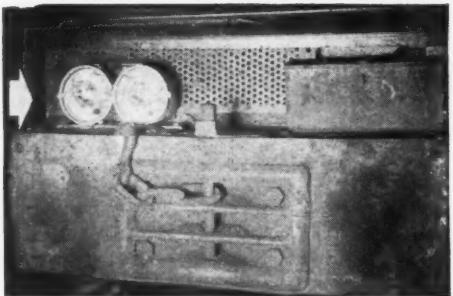


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Never without light on trips

Automatic switchover to battery power on failure of primary power source assures continuous light for greater safety.

There are numerous times during moving trips when the primary power is cut off. It is during such times that the TWINLITE prevents accidents and saves serious damage and costs. No collisions with run-away cars, no accidents due to lack of light while repoling trolley.

In addition to the battery that takes over when primary power is cut off there is another safety feature—should

one light burn out it has no effect on the other light.

Flexibility allows for mounting to suit the locomotive type and for separation of lights as desired. The battery is charged directly from trolley. The entire balanced 6-12 volt system is fool-proof.

Designed with sealed beam principle.
Get details—let us tell you what
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Advisory Boards Appointed As Coal Act Expires

In anticipation of the expiration of the Bituminous Coal Act of 1937 on Aug. 23, producer advisory boards were named for each of the districts set up under the act and certain changes were made in OPA maximum-price schedules to meet the situation growing out of abandonment of minimum prices. Records of the Bituminous Coal Division were transferred to the Solid Fuels Administration for War as a result of an order dated Aug. 17. The order became effective Aug. 24.

Establishment of "Bituminous Coal Producers' Advisory Boards" to assist in carrying out the purposes of Executive Order No. 9332 was ordered by Secretary Ickes in his capacity as Solid Fuels Administrator for War Aug. 3. Appointment of the board members for the 22 districts set up by the Act of 1937 was announced Aug. 16. They comprise members of the old producers' boards accepting the administrator's invitation to constitute themselves voluntarily as advisory boards to assist in carrying out the wartime functions of SFA.

The new boards will furnish information and advice to Mr. Ickes upon request and their own initiative. "They will be able to advise the administration on problems of production and distribution of the coal from their area. The new boards are authorized to obtain voluntary contributions for the support of their activities from producers provided their budgets and general plans of operation have been approved by the Solid Fuels Administrator.

Bituminous producers were notified by OPA Aug. 24 that they must file monthly cost forms for April, May, June and July with the Solid Fuels Branch, Washington, D. C., if they had not filed these forms with the Bituminous Coal Division of the Department of the Interior.

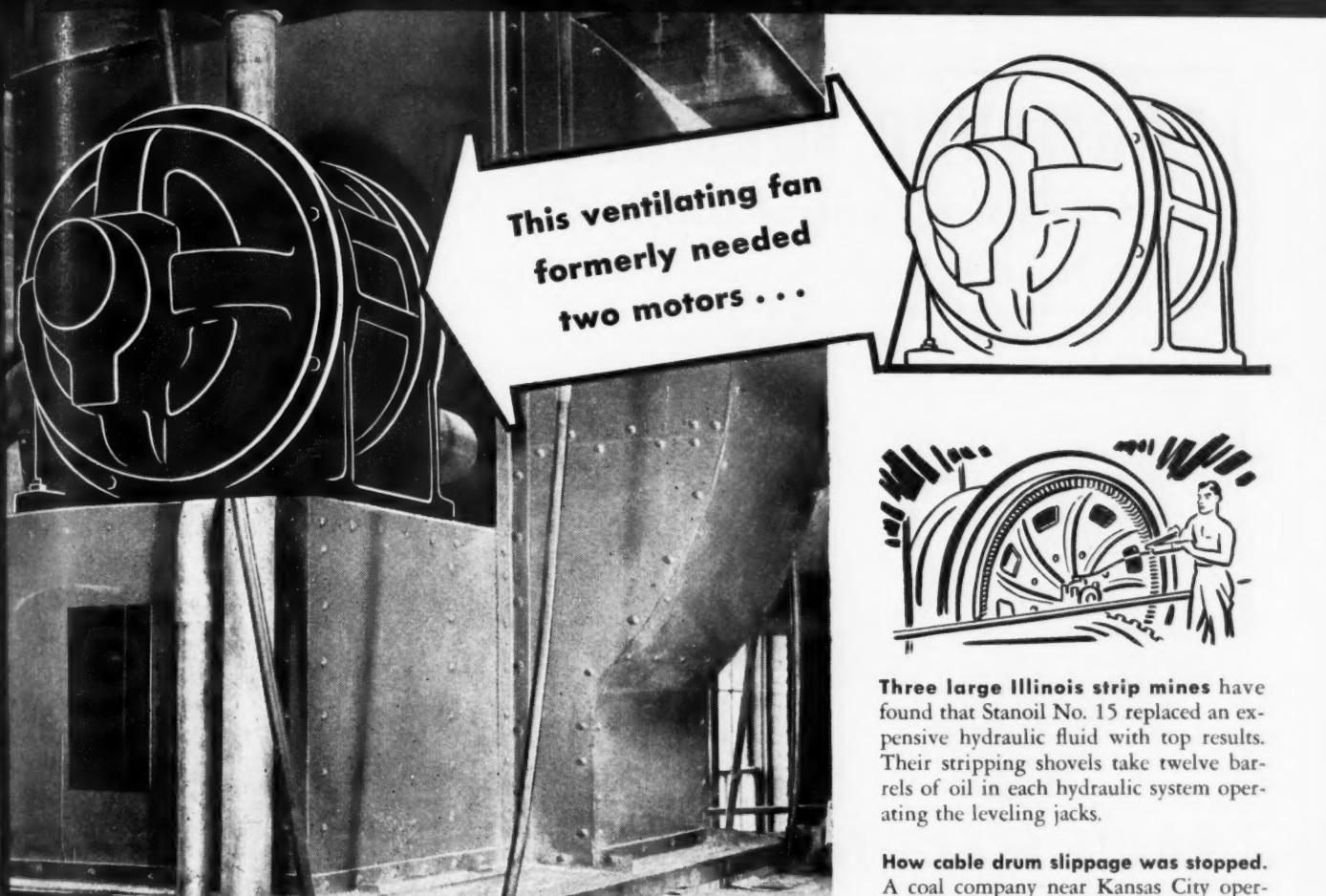
The data on these forms, which are numbered 288 and 350, have been used by both the Bituminous Coal Division and OPA in the administration of Maximum Price Regulation No. 120 (Bituminous Coal Delivered from Mine or Preparation Plant).

OPA requires the forms for April through July, and Amendment No. 60 to Maximum Price Regulation No. 120, effective Aug. 23, 1943, provides that every producer operating a bituminous coal mine, the daily average capacity of which exceeds 50 net tons, shall submit the forms to OPA except where previously filed with the Bituminous Coal Division. Requirements for the filing of financial information for months after July will be announced by OPA in the near future.

All producers and distributors of coal other than Pennsylvania anthracite, operating mines of over 50 tons daily capacity are required to make monthly reports regarding distribution of coal, Administrator Ickes announced Aug. 24 under the authority of the executive order establishing the Solid Fuels Administration.

Solid Fuels Administration.

The reports required will begin with the month of July. Special forms upon which to make these reports are now being prepared. It is anticipated that they will be ready for use so that operators may file



Stories about lubrication at work

Typical examples of how better lubricants and lubricating methods have helped midwest mine operators meet wartime demands on equipment.

• **How midwest mine released standby fan motor for active duty.** Do you have certain motors around the mine that always seem to be in trouble—with bearings that overheat, windings that get oil-soaked? If so, you're probably forced to keep spare motors—motors desperately needed elsewhere—as standby units to prevent shutdowns.

A midwest mine was up against this sort of motor headache. There were so many bearing failures on a motor hooked up to a ventilating fan that it was necessary to keep a duplicate motor on hand for standby service.

The operator decided to do something about correcting the situation. He switched from ordinary grease to Superla, with the

result that in over two years' operation there has not been a single bearing failure on this motor, and the standby unit has been released for active service elsewhere in the mine.

In the following paragraphs are brief reports from the field on how and where mine operators are applying better lubricants to simplify maintenance and get more tonnage out of present equipment.

A large western coal company reports that in spite of larger tonnages handled, the lubrication costs of its Joy loaders have not increased. Its records also show a reduction in mechanical repairs since Superla Mine Loader Lubricant was selected for this job.

Three large Illinois strip mines have found that Stanoil No. 15 replaced an expensive hydraulic fluid with top results. Their stripping shovels take twelve barrels of oil in each hydraulic system operating the leveling jacks.

How cable drum slippage was stopped. A coal company near Kansas City operating a walking dragline had trouble with leakage onto brake blocks from regular pressure gun grease applied through fittings to the drum bearings. This leakage caused slipping of the cable drum whenever stops were made. By using Superla 4-X, a heavy grease, and applying it warm through a screw-down grease gun, the dripping was eliminated.

Let a Standard Lubrication Engineer help you select and test the lubricants you need for steady, low-cost working of shovels, draglines, loaders, and other mine equipment. He can also help you work out protective maintenance schedules suited to all-out war production. Consultation involves no obligation. Write or phone the nearest Standard Oil Company (Indiana) office, or 910 S. Michigan Ave., Chicago 5, Ill., for the Engineer nearest you. In Nebraska, address any Standard Oil Company of Nebraska office.

Oil is ammunition . . . Use it wisely

STANDARD OIL COMPANY (INDIANA)

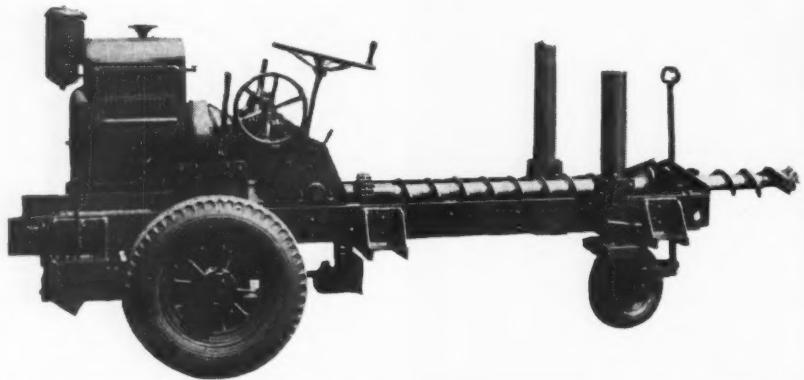
STANDARD SERVICE

★ LUBRICATION ENGINEERING

PARMANCO Horizontal Drills

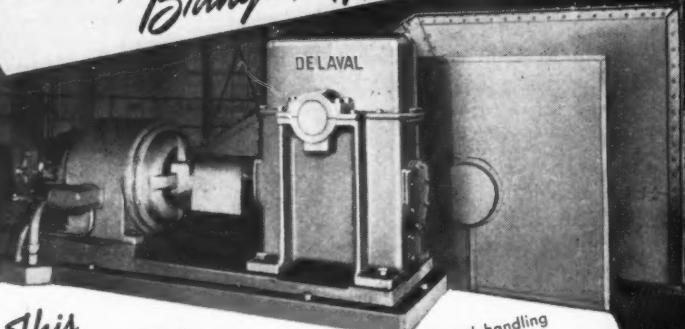
"Positive Control Drilling"

Parmanco Horizontal Drills give you "Positive Control Drilling." Parmanco Vertical and Horizontal Drills are today's leaders in low cost, low maintenance drilling—All Parmanco Drills are equipped with patented Parmanco augers. Used by leading strip mine operators—Write us your drilling problems.



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PARIS, ILLINOIS

LONG-CONTINUED SATISFACTION
Brings Repeat Order!



This DE LAVAL WORM GEAR

of 32½ ratio was installed in a coal handling plant in 1928 to transmit 40 h.p. to drive an apron conveyor. Recently the owners bought three more De Laval worm gears, two of them for conveyor drives.

Continuous operation in an atmosphere laden with abrasive dust or moisture has no terrors for a De Laval gear, which is self-contained and self-lubricating and requires no attention further than an occasional checking of the oil level.

Process plants find in mechanical conveyors with De Laval worm gear drives a superior and economical means for moving materials steadily in large quantities over long distances.

Our engineers will be glad to study your requirements and to assist with data and layouts. Ask for Publication W-1133

DE LAVAL WORM GEAR DIVISION
of the De Laval Steam Turbine Co., Trenton, N. J.

combined report for July, August, and September not later than Nov. 1. Thereafter the reports will be filed monthly on or before the first day of the second calendar month.

The reports from the bituminous coal industry will require the identification of shipments of coal by various means of transportation, all-rail, truck, river; and shipments destined for lake and tidewater transshipments, together with an accounting for local use at the mines to include a full accounting for all coal produced.

Under each method of transportation, the producer will be required to furnish a summary of the uses for which the coal is shipped: industrial, retail yards, by-product, smelting, and railroad fuel; the number of tons of each size group and destination by States and market areas. Names of consumers also will be required in the case of railroad fuel and shipments to coke manufacturers. Ports are to be identified in those cases where shipments are made for lake or tidewater shipment. Methods of movement, uses, size groups, and market areas used in making these reports are described in the orders and regulations of the Bituminous Coal Division.

The same information will be required about coals other than bituminous. However, it is planned to have a meeting with representatives of industries involved to arrange convenient statistical groups for uses, sizes and destinations.

A special report is required on ex-dock shipments, providing for data on tonnages by movement, uses, sizes and destination market areas and states. Statistical groups will be arranged with representatives of the operators.

The order and the related report forms require no data on costs, realization and prices. In the request for information care has been taken to specify data which represent the essential minimums. Moreover, considerable study has been given to forms which are set up to fit standard practices. Many experts from the coal industries have contributed a large amount of time helping prepare the form upon which the reports will be made.

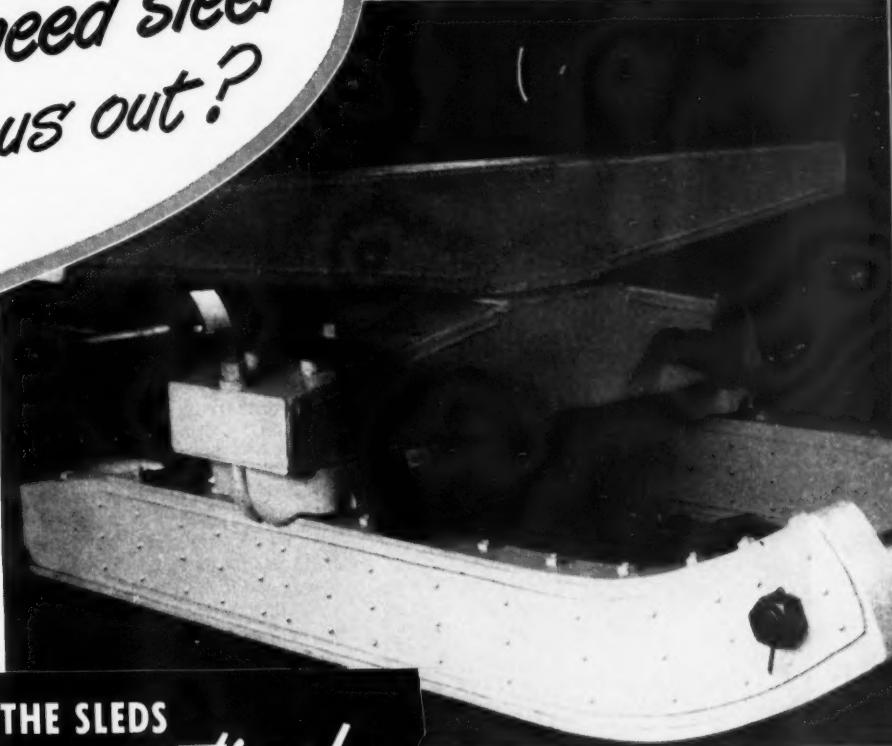
Reports covering the desired information now are being made with respect to the Pennsylvania anthracite industry.

Committee on River Pollution Named by Governor Martin

With the appointment of five cabinet members to make a study of conditions in the Schuylkill River, Governor Martin late in August launched a comprehensive campaign against pollution of streams in Pennsylvania. The Governor said the work of ridding the river of pollution, including silt, will be undertaken as a post war project and will eventually extend to the Delaware, Susquehanna and Allegheny rivers.

Heading the Governor's committee is Secretary of Internal Affairs William S. Livengood Jr. Other members are Attorney General James H. Duff, Secretary of Forests and Waters James A. Kell, Secretary of Health A. H. Stewart and Secretary of Mines Richard Maize.

The Army is hollering for
these sleds—we need steel—
can you help us out?



**WE COULD . . . WE DID . . . THE SLEDS
WERE DELIVERED *on time!***



FILLING rush orders is nothing new to us. We've been at it for years. The only difference now is that we can't fill *all* the requests all of the time. For material shortages sometimes make it impossible.

But we're in business to help you get the steels you want if it is possible to get them to you. And every man in our nine big warehouses, from the man who takes the order to the man who ships the goods, is trained to remember that our business was built upon friendly, efficient service.

Do you need steel, steel products, tools, machinery, equipment? Call

us. We've filled the bill for so many wartime manufacturers that there is a good chance we can help you, too. Write, phone or wire any of the warehouses listed below. They'll all give you prompt attention — do their best to help you.



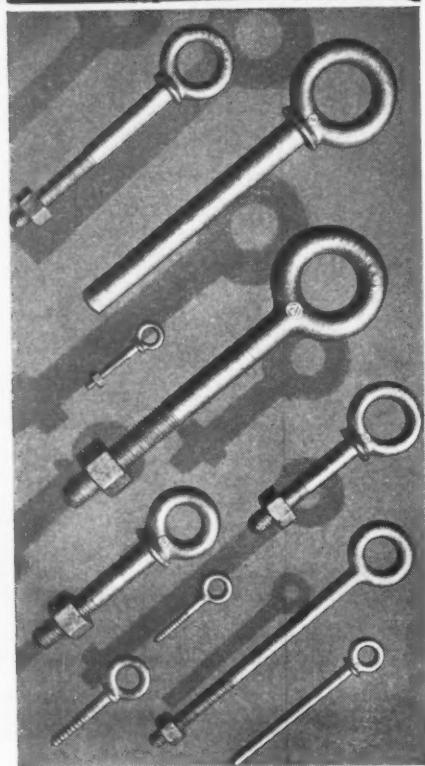
THESE GIANT SLEDS are capable of carrying 80 tons of material—60% more than the average freight car! They were made for the U. S. Army by a Wisconsin manufacturer. By furnishing materials just when they were needed, we helped this manufacturer meet a difficult production schedule—on time!

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BALTIMORE (3),	Bush & Wicomico Sts.,	GILmore 3100 Teletype BA 183
BOSTON (34),	176 Lincoln St., Allston, P. O. Box 42	STADIUM 9400 Teletype BRTN. 10
CLEVELAND (14),	1394 E. 39th St.,	HENDERSON 5750 Teletype CV 153
MILWAUKEE (1),	4027 West Scott St., P. O. Box 2045	MItchell 7500 Teletype MI 587
NEWARK, N.J. (1),	Foot of Bassemer St., P. O. Box 479	Bigelow 3-5920 REctor 2-6560
PITTSBURGH (12),	1281 Reedsdale St., N. S.	BERgen 3-1614 CEDar 7780 Teletype PG 475
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FOR ALL JOBS**



Keep your eye on this picture if you're thinking of having special bolts made up. Every minute counts! Laughlin standard eye bolts will likely fill the bill. All weldless — all drop forged steel. Nut type with extra length threads for extra adjustment. Send for latest Laughlin Catalog showing standard stock eye bolt sizes in nut, screw and rivet types.

Distributed through oil field supply houses

Look for Laughlin Products In Coal Mining Catalogs

**THE THOMAS
LAUGHLIN
Company
PORTLAND, MAINE**



**Gravity Slope Squad Captures
Hudson First-Aid Contest**

Gravity Slope team, with a score of 99.8, won the Hudson Coal Co.'s annual intracolliery first-aid contest, held Aug. 21 at the Scranton baseball stadium, Dunmore, Pa. Olyphant colliery placed second with 99.5 and Marvine colliery was third with 98.5.

Prizes were awarded by Cadwallader Evans Jr., vice president and manager of the company. Honorary judges were Dr. R. R. Sayers and D. C. Harrington, U. S. Bureau of Mines, and Richard Maize, secretary, Pennsylvania Department of Mines. Active judges were L. L. Naus, U. S. Bureau of Mines, and Dr. R. T. Wall, Hudson Coal Co.

To Reopen Suquash Mine

Port McNeill Coal Co., incorporated at Victoria, B. C., plans to reopen the Suquash coal property, 10 miles from Port Hardy at the north end of Vancouver Island, according to an announcement made by Patrick J. Sinnott, company legal adviser. Coal has not been mined at Suquash for 15 years, and much of the original machinery was removed, but accommodation for workmen and office quarters are reported to be habitable.

Mr. Sinnott stated that Pacific Coast Collieries, Ltd., developed extensive under-

ground workings at Suquash, and the coal was stated to be of excellent quality, with a satisfactory seam. He said the present company was incorporated with a view to pumping out the mine and, if machinery and labor could be obtained, it was hoped to commence production of coal some time this year.

Coal-Mine Accident Fatality Rate Again Short of Last Year

Accidents at coal mines of the United States caused the deaths of 69 bituminous and 12 anthracite miners in June last, according to reports furnished the U. S. Bureau of Mines by State mine inspectors.

With a production of 34,650,000 net tons, the accident death rate among bituminous miners in June last was 1.99 per million tons, compared with 2.45 in June, 1942.

The anthracite fatality rate from accidents in June last was 3.75 per million tons, based on an output of 3,203,000 tons, against 4.10 in the sixth month of last year.

For the two industries combined, the accident fatality rate in June last was 2.14, compared with 2.61 in the corresponding month a year earlier.

Fatalities during June last, by causes and states, as well as comparable rates for the first six months of 1942 and 1943, were as follows:

UNITED STATES COAL-MINE FATALITIES IN JUNE, 1943, BY CAUSES AND STATES

State	Underground						ee	m	ee	Surface	Grand Total
	Falls of Roof	Falls of Face	Haulage	Gas or Dust Explosions	Electricity	Other Causes					
Alabama.....	1	1	1	1	1	1	2	1	1	1	1
Colorado.....	1	1	1	1	1	1	2	1	1	1	1
Illinois.....	3	3	3	3	3	3	12	12	12	12	12
Indiana.....	7	7	7	7	7	7	12	12	12	12	12
Kentucky.....	1	1	1	1	1	1	1	1	1	1	1
Missouri.....	1	1	1	1	1	1	2	2	2	2	2
Ohio.....	1	1	1	1	1	1	1	1	1	1	1
Oklahoma.....	10	10	10	10	10	10	14	14	14	14	14
Pennsylvania (bituminous).....	2	2	2	2	2	2	2	2	2	2	2
Utah.....	2	2	2	2	2	2	3	3	3	3	3
Virginia.....	2	2	2	2	2	2	3	3	3	3	3
Washington.....	1	1	1	1	1	1	1	1	1	1	1
West Virginia.....	12	12	12	12	12	12	17	17	17	17	17
Total bituminous.....	42	42	42	42	42	42	65	65	65	65	65
Pennsylvania (anthracite).....	6	6	6	6	6	6	7	7	7	7	7
Grand total.....	48	48	48	48	48	48	72	72	72	72	72

DEATHS AND FATALITY RATES AT U. S. COAL MINES, BY CAUSES OF ACCIDENTS*

January-June, 1942 and 1943

Cause	Bituminous				Anthracite				Total			
	1942 Number Killed	1943 Killed per Million Tons										
Underground:												
Falls of roof and coal...	307	1.075	303	1.064	77	2.610	76	1.589	384	349	1.219	1,111
Haulage.....	111	.389	112	.393	18	.610	18	.614	129	130	.409	.414
Gas or dust explosions:												
Local.....	5	.13	18	.046	4	1	136	.034	9	14	.029	.045
Major.....	101	.97	354	.340	5	5	169	.170	101	97	.321	.309
Explosives.....	12	.14	402	.049	5	5	169	.170	17	19	.054	.061
Electricity.....	20	.17	670	.060	3	3	102	.102	23	17	.073	.054
Machinery.....	22	.11	777	.039	1	1	34	.034	22	12	.070	.038
Shaft.....	3	.6	101	.021	2	2	68	.068	5	6	.016	.019
Miscellaneous.....	18	.21	663	.074	7	8	237	.273	25	29	.079	.092
Stripping or open-cut.....	12	.15	402	.053	1	7	334	.239	13	22	.041	.070
Surface.....	22	.30	777	.105	5	10	169	.341	27	40	.086	.127
Grand total.....	633	2.217	639	2.244	122	4.135	96	3.274	755	735	2.397	2.340

* All figures subject to revision.



Rigging... for the bridge of ships

Hundreds of tons, millions of feet, of Bethlehem Wire Rope are being used in rigging cargo ships for American convoys bound to Britain and the Mediterranean and to the Solomons.

Bethlehem Wire Rope is furnished in every size, grade and construction used on both merchant ships and warships. We are

supplying everything from guys and lashings to towing hawsers, elevator cables and hard-running winch ropes. Bethlehem's wire-rope mill is working 168 hours a week to turn out the tremendous quantities of wire rope needed for the bridge of ships, as well as to meet hundreds of pressing war-production needs on the home front.



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COAL AGE

Personal Notes

FRED J. BAILEY has been transferred from the Mineral Production Security Division, U. S. Bureau of Mines, to the Coal Mine Inspection Division as federal coal mine inspector with headquarters at Price, Utah. He was formerly with the Koppers Co. as general inspector and was first president of Welch (W. Va.) Post, Smoke Eaters.

ANDREW BROWN, formerly general assistant mine foreman at Montour No. 4 mine of the Pittsburgh Coal Co., Hills Station, Pa., has been named mine foreman at Henderson mine, Hendersonville, Pa.

WALTER A. BUCHANAN, manager of the Welch (W. Va.) district of the Appalachian Electric Power Co. for a number of years, has resigned to accept a position with the Island Creek coal interests in Huntington, W. Va. He will become general manager of the Island Creek Fuel & Transportation Co., a wholly owned subsidiary which transports and handles the river sales of coal produced by the Island Creek company.

WORLEY D. COLLIER, Kona, Ky., mine foreman for several years for the Elkhorn Coal Co., resigned that position to accept a similar one with the Banner Fuel Co., Cranes Nest, Va. He assumed his new duties July 15.

O. B. CLARK, formerly with the West Virginia Coal & Coke Corp., has been appointed superintendent of Mine 2, Boone County Coal Corp., Sharples, W. Va.

H. L. COPHER, formerly superintendent, Boone County Coal Corp., Sharples, W. Va., has been named general superintendent of underground mines of the Pyramid Coal Corp., Terre Haute, Ind.

D. H. DAVIS, who was acting product control manager for the Pittsburgh Coal Co. during the absence of H. F. Hebley, has been appointed product control manager, vice Mr. Hebley, who has been made director of research.

CLIFFORD DAWE, mine foreman at Nonac mine of the Colorado Fuel & Iron Corp. since July, 1942, has been advanced to superintendent of the operation. He succeeds J. L. McBrayer, transferred some time ago to Kebler No. 2 mine, since which time Mr. Dawe had been acting superintendent.

CHARLES H. DODGE, formerly senior coal-mine inspector with the U. S. Bureau of Mines at Mt. Hope, W. Va., has been appointed assistant chief of the Rescue Section recently established in the Medical Division of the Office of Civilian Defense. A native of Pennsylvania, Mr. Dodge was graduated in mining engineering from the University of Illinois and later took a master's degree at Carnegie Institute of Technology. Prior to his connection with the Bureau of Mines he was employed as engineer, operator and safety director by mining and construction companies in many parts of the United States.

GEORGE H. ESSER, secretary-treasurer of the Virginia Coal Operators' Association for the last 7½ years, was elected president at a postponed annual meeting of the organization. He also will continue as secretary-treasurer. He succeeds J. D. Rogers in the presidency. E. H. ROBINSON was re-elected assistant secretary.

T. G. FERGUSON, superintendent at Montour No. 4 mine of the Pittsburgh Coal Co., Hills Station, Pa., has been appointed superintendent at nearby Henderson mine. He assumes this duty in addition to his post at Montour.

LEONARD C. JOHNSON, general manager of the Jewell Ridge Coal Corp., Tazewell, Va., has been engaged as general manager of mines by W. H. Warner & Co., with headquarters at St. Clairsville, Ohio. A graduate of Oklahoma School of Mines, he formerly was connected with the Consolidation Coal Co. and some of the large Illinois operators in a managerial capacity.

J. A. LEWIS, heretofore superintendent of the Brule mine of the Brule Smokeless Coal Co., Cleveland, Ohio, has been appointed general superintendent of the coal mine division of Oglebay, Norton & Co. R. A. LEWIS has been named superintendent of the Brule mine.

D. L. McELROY, chief engineer of the Consolidation Coal Co., Fairmont, W.

*Coal Production
Depends on Haulage*

*...Haulage depends on
Good Track!*

To help you "keep 'em rolling" we can assure prompt delivery on a number of standard track equipment items—among them being the Heavy Service Room Frog shown above.

In this Frog, as built by The West Virginia Rail Company, you can have these features of design and construction:

- Extended plate for permanence and solid stability.
- Heel risers to save points from batter, wear, and splitting caused by worn wheels.
- Throat block to bind the wings together when derailed cars are pulled into the frog.
- Welded one piece point for rigidity and long life.
- Wing ends depressed to prevent catching of any dragging parts of rolling equipment and the catching of men's feet in the flare of the guard rail.

Write today . . . list those items you need . . . or call in a West Virginia Rail Engineer. He'll go over your track equipment or track troubles with you and make recommendations without obligation.

THE WEST VIRGINIA RAIL COMPANY

HUNTINGTON



WEST VIRGINIA

the West
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COAL AGE

An Ounce of Prevention...

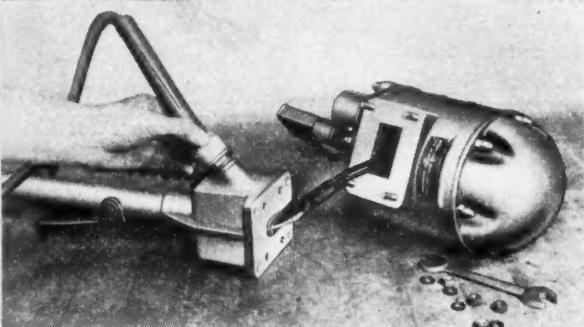


ASSURES TONS OF COAL

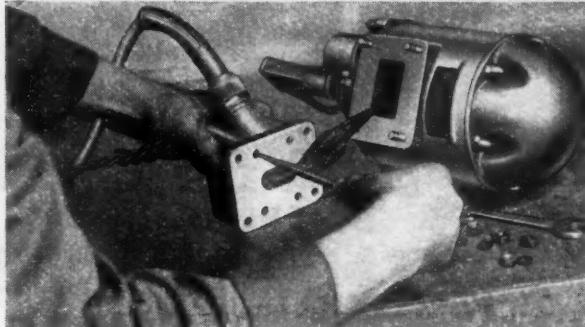
CP Hand-Held Electric Coal Drills require a minimum of simple attention to keep them in good running order.

Replace damaged gaskets and keep all nuts tight to prevent the infiltration of coal dust and the loss of lubricant. Do not neglect a faulty electric connection. Inspect switches regularly. Keep the cable free of grease and oil...and never carry a drill by the cable.

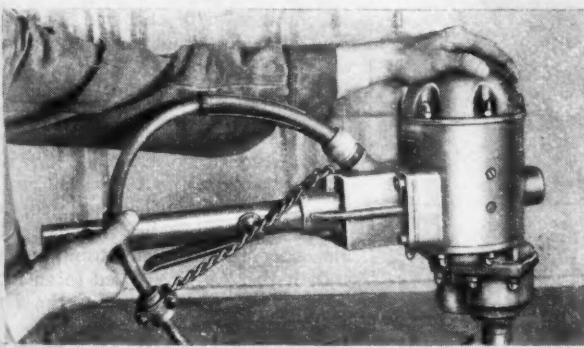
HOW TO GET MAXIMUM SERVICE FROM CP ELECTRIC COAL DRILLS



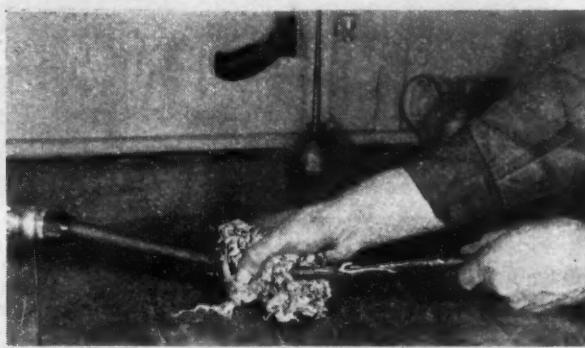
1 To replace cable or switch, loosen cable protector and clamp-nut to release cable.



2 Inspect switches regularly. Plate and gaskets are seals — keep tight and in good condition.



3 Never carry or drag a drill by the cable. Keep cable strain relief in the arc shown.



4 Always keep rubber cables free of grease and oil, otherwise they will swell and rot.

★★★★★
PNEUMATIC TOOLS
ELECTRIC TOOLS
(Hycycle...Universal)
ROCK DRILLS

CHICAGO PNEUMATIC
TOOL COMPANY

General Offices: 8 East 44th Street, New York 17, N.Y.

★★★★★
AIR COMPRESSORS
VACUUM PUMPS
DIESEL ENGINES
AVIATION ACCESSORIES

*"Our Armature
Costs Cut—
by change to
Ball Bearings"*

(Mine Maintenance Supt.)



A recent survey through the big producing mines in the Appalachian Field, reveals some results of converting sleeve-bearing motors to ball bearings. These mine maintenance men report that: Cost of armature repairs is cut; commutators last longer; coils are clean and free from oil and dust, and maintenance cost is substantially reduced.

The REASONS WHY printed opposite tell plainly how these changes are brought about with

KEYSTONE BALL-BEARING END BELLS

They come all ready to install—we only ask you to turn down the motor shaft to a stated size. We do the rest. In a brief time your shop-men can easily make the installation.

Send for Detailed Information

KEYSTONE Electric
Company

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AMPLE
Superior
STOCKS



AMPLE stocks point to adequate resources and a reliable source of raw materials. We can make reasonably prompt shipments NOW. Write for our Reference Catalog No. 7 on mining equipment brushes (no advertising in it) . . . A few sales territories are still open.

**SUPERIOR CARBON
PRODUCTS, INC.**

Cleveland 5, Ohio

9111 George Avenue
**SUPERIOR CARBON
BRUSHES**

Va., has been named by the National Coal Association as its representative on the Mining Standardization Correlating Committee of the American Standards Association. He succeeds the late F. M. McDaniel, chief engineer of the Dawson Coal Co., Clarksburg, W. Va.

ALEX PROFITT, for several years identified with a number of coal-operating concerns in eastern Kentucky, has been named chief electrician for the Carbon Glow Mines, Inc., Carbon Glow, Ky.

E. A. RICKARD, formerly chief electrician at the Wharton (W. Va.) mine of the Koppers Coal Division, has accepted a position with the New River Co., Whipple, W. Va., as division electrician of Oakwood, Whipple, Summerlee and Lochgelly mines.

F. R. SCHOLL, formerly superintendent, Ridgeview Coal Co., Nellis, Boone County, W. Va., has been appointed general superintendent of mines, C. H. Mead Coal Co., Eastgulf, Raleigh County, W. Va.

WILLIAM B. WHEELER has been appointed deputy chief of the Coal Section, Mining Division, War Production Board. With the Division as assistant technical adviser since January, 1942, Mr. Wheeler will continue to handle coal-mining priority matters covering the same group of states as heretofore.

Less Hot Water and Heat Urged To Meet Canada's Fuel Crisis

Nothing would be more damaging to Canada's war effort than a critical shortage of coal during the next heating season, C. D. Howe, Minister of Munitions and Supply, said in his report to Parliament on the operations of war industries throughout the Dominion. The Minister dealt also with fuel wood and said that the problems arising from the shortages of these two vital materials were among the most pressing facing Canada.

Consumption of coal had increased by more than 45 percent since the war began, Mr. Howe reported.

"In 1939," he told the House of Commons, "we used 28,500,000 short tons; last year 41,500,000 short tons and in the current year we expect to use 47,250,000 short tons. Since the 1938-1939 coal year Canadian production has increased, but to an extent much smaller than the proportionate increase in total consumption. The result is that we have relied to an increasing extent on imports from the United States.

"Since the war began our imports from the United States have nearly doubled. As requirements in the United States also are increasing, it is impossible to forecast with any degree of certainty what quantity of coal we can import from the United States in the current year. So far this year our United States imports have been lower by more than half a million tons than those of last year. All of this means that Canada faces a possible shortage of 4,000,000 short tons during the current year. We can meet this shortage only by increasing Cana-



Look at Your Conveyor Problems

Through *Experienced Eyes*

In your industry, yours are the experienced eyes. We, at Stephens-Adamson, have the trained and experienced eyes in the material handling field.

Here are competent engineers (who have spent entire careers with this company)—ready always to help you gain an objective view of your conveying problems. For them, the highest goal is the installation of the right conveying system for any specific job . . . Here are men

thoroughly qualified to go over your present or anticipated operations with one constructive aim—to discover faster, safer, low cost ways of moving materials.

This is most significant when you start thinking—as we already are—about post-war conveying problems connected with new processes, new materials, new finished goods you may have in mind. Call in an S-A engineer to give you sturdy pegs on which to hang your thoughts.

STEPHENS-ADAMSON MFG. CO., 2 Ridgeway Ave., Aurora, Ill.

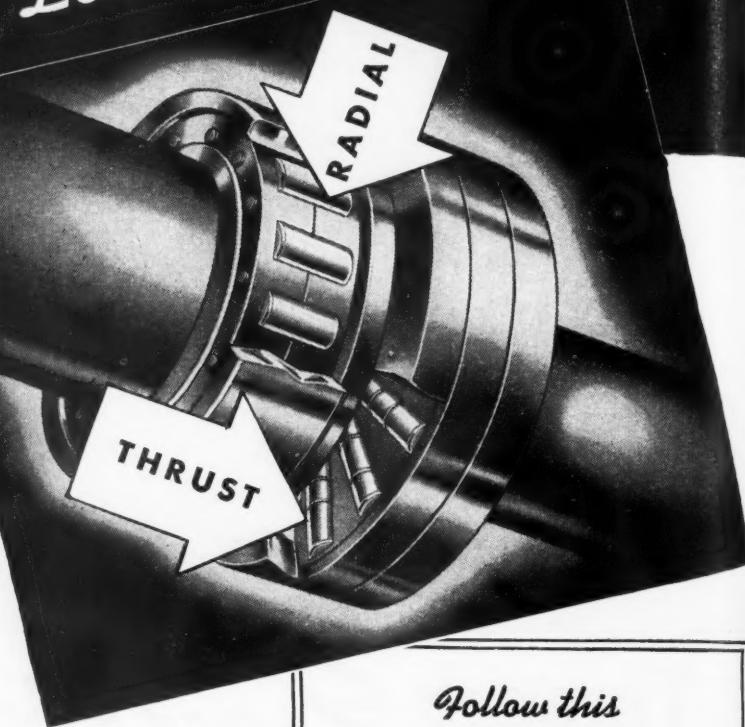
STEPHEN S-A ADAMSON
MFG. CO.

*Designers and Manufacturers of All Types of
BULK MATERIAL HANDLING EQUIPMENT*

WANT LONGER
BEARING LIFE?
Want Less Down Time?

SIMPLIFY
Load Stresses
the
ROLLWAY
Right-Angle Way

By carrying every load—both radial and thrust—at right angles to the roller axis, Rollway's solid cylindrical roller bearings automatically split the load into the two fundamental components of *pure* radial and *pure* thrust. That reduces the load stresses per roller and per bearing. It eliminates all compound loads, and all oblique resultants. You get more accurate engineering of the bearing to the job. You get a bearing which lasts longer under heavier loads and continuous running. Downtime for maintenance and replacement is substantially reduced.



Follow this
**BASIC BEARING
PRINCIPLE**

- Carry all radial loads at right angles to the roller axis.
- Carry all thrust loads at right angles to the roller axis.

Standard Sizes for Most Applications

Rollway has developed a large list of types of solid cylindrical roller bearings in both SAE and American Standard metric sizes, each having definite characteristics to meet exacting needs. Take full advantage of this wide choice of types and sizes. Let Rollway's specialized bearing experience help you in your choice. Just send a sketch or detailed description of your machine design or bearing problem.

A confidential bearing analysis and recommendation will be returned to you without cost or obligation.

ROLLWAY

BUILDING HEAVY-DUTY BEARINGS SINCE 1908

BEARING COMPANY, INC., SYRACUSE, NEW YORK

BEARINGS

dian production and by rigorous conservation of existing supplies.

"It is planned to return to coal mines," continued Mr. Howe, "every man in civilian industry who has worked previously in this highly skilled occupation. Men in the armed forces who wish to go back to the mines will be given every assistance to do so, consistent with military policy. No coal miner will be drafted or permitted to enlist in the armed services or allowed to change his occupation, without permission of National Selective Service. We hope that these measures will increase manpower in coal mines to the point where the estimated production will be increased by 3,000,000 short tons. I appeal to all those who are working in our coal mines to do their utmost to help obtain increased production."

The shortage of fuel wood is as serious as the coal situation, said Mr. Howe. As a result of inadequate cutting in the winter of 1941-42, the residents of many communities have, during the past few months, suffered severe hardship. The extreme severity of the winter increased consumption, made deliveries difficult, and curtailed drastically production for next winter. Following the announcement in March that the government would pay fuel-wood dealers a subsidy of \$1 per cord, some increase in production has been noted. The situation is still serious, however, and many communities may be in short supply next winter unless immediate local action is taken.

In an address prepared for national

broadcast, Mr. Howe said that an order-in-council would be passed by the Canadian Government which would make it an offense to waste coal or heat and that the order would apply to everyone—householders as well as commercial and industrial users. He announced that under the order maximum temperatures will be established for industrial plants and commercial and other buildings, the temperatures to vary according to the need.

"For example," he said, "less heat will be permitted in theaters, auditoriums and other public buildings where people gather for short periods and where warm clothing can be worn. When this type of building is not in use, the temperature will be reduced drastically. Temperatures in schools will be dropped sharply as soon as school is out. The same will apply to office buildings after working hours."

The minister said certain industries have already made considerable headway in conserving coal, and it is estimated that through these measures more than 100,000 tons has been saved. To achieve the purpose of the order a nationwide conservation program will be launched, with the object of saving at least 20 percent of the coal which was burned last year.

The minister said the government will ask owners of commercial buildings and industrial plants to appoint special coal wardens, whose duty it will be to see that every conservation measure is taken.

In a move to conserve wood fuel, the Munitions Department announced that a ban has been placed on the construction

POSITIVE PROTECTION

against

- ★ FLAME
- ★ FUNGI
- ★ LEAKAGE
- ★ SHRINKAGE

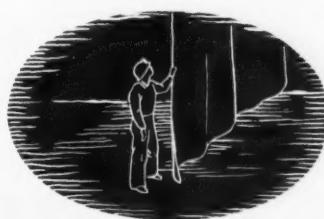
ABC BRATTICE CLOTH

In wide use ABC Brattice Cloth has demonstrated its ability to dependably resist flame and fungi . . . under the most severe conditions!

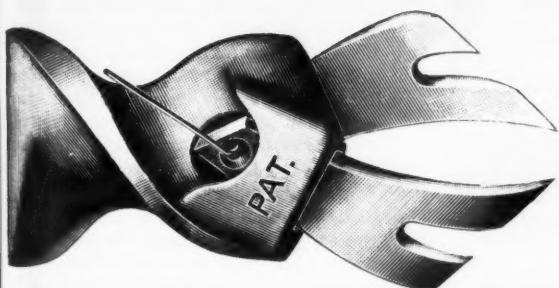
ABC Brattice Cloth is woven from heavy yarns, loomed skillfully and uniformly throughout . . . resists leakage and shrinkage even in a very wet mine.

OUR LARGE FACTORY STOCKS
ENABLE US TO INSURE
PROMPT DELIVERIES

Write . . . complete details are available on request.



A NEW POSITIVELY HELD-IN 4-POINT BIT



McLaughlin No. 4AT

Heads can be furnished in three sizes:

- No. 33 head drills a 2 $\frac{1}{8}$ " hole
- No. 24 head drills a 2 $\frac{1}{8}$ " hole
- No. 25 head drills a 3 $\frac{1}{8}$ " hole

Suitable for welding to common twist or conveyor augers.

Write for full particulars

See our full page advertisement in Coal Mining Catalog 1943 Edition.

McLAUGHLIN
MANUFACTURING CO.
Joliet, Illinois

American BRATTICE
CLOTH CORPORATION
WARSAW, INDIANA

Agencies in all Mining Centers



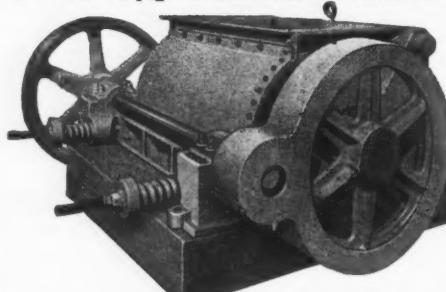
● Page Buckets answer today's call for speed on all earth-moving jobs, because, automatically, they dig right in, doing more work per shift. The result is lowered cost of operation—**INCREASED PROFITS** for you! It's the **AUTOMATIC** feature of a Page Bucket that causes it to strike first on its forward arch, and rock back on the teeth, ready for the first pull of the load line to start the bite! It's the **AUTOMATIC** feature that enables it to outdig any other dragline bucket of equal size and weight.

PAGE Automatic DRAGLINE BUCKETS

PAGE ENGINEERING COMPANY • CHICAGO, ILLINOIS

6" to 1¼" SIZES PRODUCED WITH

**THIS LINE OF
SINGLE ROLL
CRUSHERS**



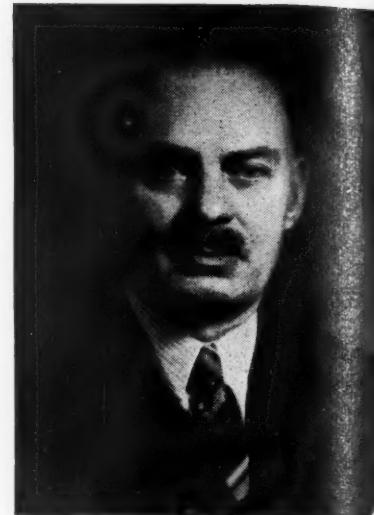
Install one for primary breaking, and Stoker Coal Crusher for secondary breaking to Stoker Coal Sizes. Available in heavy, standard, and light types.

PROMPT SHIPMENT
CAN BE MADE

**M'NALLY PITTSBURG MFG.
CORP.**

MANUFACTURERS OF EQUIPMENT TO MAKE COAL A BETTER FUEL
Main Office and Works General Sales Office Eastern Office
Pittsburg, Kansas 307 N. Michigan Ave., Chicago Koppers Bldg., Pittsburgh, Pa.

Send
for
Latest
Bulletin



E. J. Brunning, Coal Controller of Canada.

of new charcoal kilns or additions to existing kilns. The new order, issued by Wood Fuel Controller J. S. Whalley, also prohibits, except by permit, the production of charcoal from any kiln or other facility not now in use or available for immediate use.

As a means of conserving coal, Mr. Howe appealed Aug. 14 to business building owners to cut off at once the supply of hot water to their tenants. "Except for hospitals, clinics, and buildings containing doctors' or dentists' offices, barbers, or other occupants who must have hot water to carry on their vocation, and except for factories and warehouses where the employees must frequently wash, there are very few business buildings which require hot water," Mr. Howe said.

The Department of Munitions and Supply announced Aug. 14 that shipments of Alberta coal to eastern Saskatchewan and Manitoba will be "drastically reduced" because of unprecedented demands from local markets in the far west. Coal Controller E. J. Brunning said coal reserves in British Columbia and Alberta have been reduced because of a rise in industrial consumption on the west coast, an increase in bunkerage requirements and the "unusually large" demand from householders during the past winter. Consequently, he said, coal which formerly found its way to the eastern prairies must be diverted to the west coast, and as a result the people of eastern Saskatchewan and Manitoba will have to depend to a greater extent than ever upon coal mined in their own provinces.

A conservation division of coal control has been established with Norton W. Kingsland, Toronto, as director, the Department of Munitions announced Aug. 11. Coal Controller E. J. Brunning said the new division will be responsible for getting in touch with the thousands of industrial concerns which must conserve coal in order to stretch available supplies as far as possible. It also will be responsible for a campaign to inform the public of the gravity of the coal shortage and the methods the householder can employ to save fuel.

Toronto coal dealers are organizing a

coal exchange among themselves which, it is hoped, will go a long way toward overcoming some of the difficulties of fuel supply encountered in last winter's emergency. It will be a pool system, embracing not only coal but delivery equipment and personnel, and dealers will aid each other in emergency deliveries. Already upward of \$20,000 has been contributed by the dealers toward a fund for founding the exchange. Several more meetings of the trade's special coal committee are to be held to complete arrangements.

In a letter to Mayor F. J. Conboy of Toronto, E. J. Brunning, Coal Controller, says the government had rejected a proposal by the Toronto Board of Control that the Dominion assume control of the fuel business from "mines and forests to the consumers" (Coal Age, August, pp. 135-138). He added: "At the present time the Dominion Government, through its agencies, has jurisdiction over all phases of the fuel industry. It is, however, the desire of the government not to interfere in private business to any greater extent than becomes absolutely necessary."

Mayor Lucien Borne has issued an appeal to residents of the Quebec district able to work in coal mines to volunteer for such work.

Coal Controller W. J. Taylor of Calgary, Alberta, reports that strip-mining projects are being established at seven points throughout the province to relieve the expected coal shortage this winter. Coal seams are being opened at Airdrie and Taber, in the southern part of the province, and at Dodds, Camrose, Castor, Tofield and south of Lake Wabamum. Mr. Taylor said the general supply situation is "slightly easier, but the utmost cooperation of the consuming public will be necessary to meet the serious supply situation during the winter."

Test Plants for Liquid Fuel Approved in Hearings

Hearings on Senator O'Mahoney's bill providing for government-built demonstration plants to produce synthetic liquid fuels from coal and other substances (Coal Age, August, p. 112), which began Aug. 3 in Washington, elicited no opposition to the plan even by oil industry men. Witnesses at the first hearing, held before the Subcommittee on War Minerals of the Senate Committee on Public Lands and Surveys, with O'Mahoney as chairman, approved the general purposes of the measure, although some suggested limitation of government activity to experimentation, with private industry taking over the marketing job if and when abstraction of liquid fuel from coal is proved practicable.

As spokesman for the bituminous coal industry, John D. Battle, executive secretary of the National Coal Association, warmly indorsed the project.

"The proved reserves of bituminous coal are sufficient to meet the nation's needs for many centuries, either for use in its natural state or for conversion into liquid fuel," said Mr. Battle. "Our association, comprising the bituminous

coal producers from all parts of the country, approves the idea of the government engaging in experimental and demonstrative studies to the extent of building a pilot plant or plants necessary to prove the feasibility of abstracting oil and other fuels from coal. We think it entirely proper that the government undertake research work of the character proposed. There is no better group in the government than the U. S. Bureau of Mines to carry on this work. We in the coal industry have the highest regard for that organization and feel that a good job will be done under its direction.

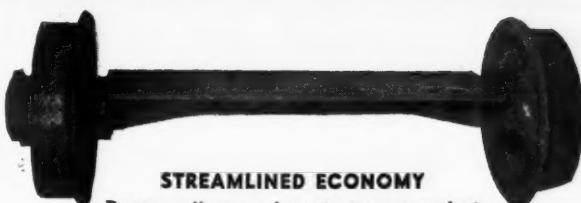
"If and when the practicability of the abstraction of liquid fuel from coal, on a commercial basis, is demonstrated, then

private industry can be relied on to take it over at that point," the witness added. "I hope the government will prove the process and engage in the experiments and I suggest that this legislation be amended so that the government would not find itself engaging in the business of selling a finished product because necessarily it would have to be sold in competition with other liquids of similar value, and this is not a proper function of government."

W. J. Lauck, economist for the United Mine Workers of America, favored the scheme as a possible means of increasing employment in the coal-mining industry in the future.

The only oil industry men appearing at the Washington hearing, Dr. Gustav

Modern low cost answer to immediate mine-car needs..



STREAMLINED ECONOMY

Duncan offers an important new product that eliminates vitally important mill shapes not now easily procured.

SUPERIOR BY TEST

The following results were obtained by placing two axles in hydraulic press, each bolted flat on face of press and bent to a 30° angle on each end of axle: CAST AXLE . . . 225 tons—ROLLED AXLE . . . 200 tons—neither axle showing a sign of fracture.

DUNCAN Integral-Cast STEEL AXLE

Eliminates the need of

- 1 ROLLED AXLE
- 1 ROLLED CHANNEL
- 2 SHRUNK-ON DUST COLLARS and
- 2 CAST-STEEL BOXES

Carefully controlled chemical properties and careful heat treating of cast steel axles will equal the strength of rolled axles. Cast axle weighs only 125 lbs. complete—eliminating 225 lbs. of weight.

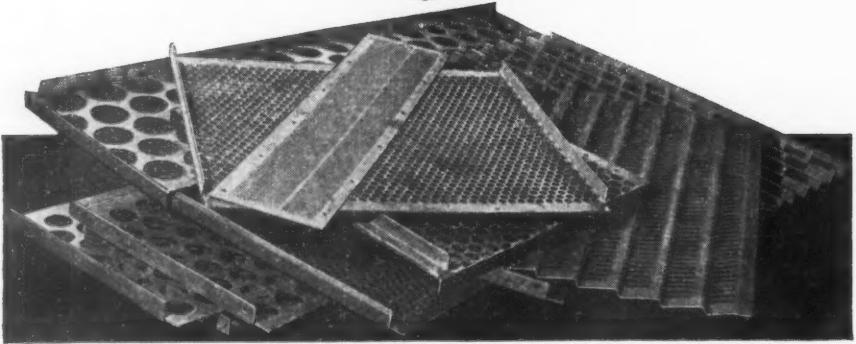
STEEL MINE CAR WHEELS AND TRUCKS TO ANY SPECIFICATIONS

Duncan is headquarters for all steel mine car wheel and truck requirements; loose and tight wheels with ball, roller, or sleeve bearings; continuous and roller-bearing trucks, etc. Write us about your requirements.

DUNCAN FOUNDRY & MACHINE WORKS, INC.

ALTON, ILLINOIS

Do you use PERFORATED METAL SCREENS?



Let PHILLIPS
solve your sizing and grading problems!

PERFORATED METAL SCREENS FLANGED LIP SCREEN PLATES

CYLINDRICAL . . . CONICAL . . . FLAT SECTIONS
SQUARE . . . OBLONG . . . ROUND PERFORATIONS

*Write or wire—stating your requirements—for
quotation and delivery data.*

MANUFACTURERS
SINCE 1863

PHILLIPS
MINE AND MILL SUPPLY COMPANY

PITTSBURGH,
PENNA.

MINE & INDUSTRIAL CARS—FABRICATED STEEL—IRON CASTINGS

AVOID TONNAGE DELAYS with Mesco Insulator Switches



MOSEBACH

ELECTRIC & SUPPLY COMPANY
1115 Arlington Avenue, Pittsburgh 3, Pa.

• Modern equipment is vital and necessary to meet current demands for greater coal tonnage. Coal is the basic raw material in the manufacture of our implements of war.

• Increase your tonnage by using Mesco Insulator switches, built for safety and service. Ease and safety in manipulation make Mesco switches ideal for use with any trolley wire and feeder cable in combinations. Write for complete information.

Egloff, director of research for Universal Oil Products Co., Chicago, and Robert P. Russell, vice president, Standard Oil Development Co., New York, confined their comments chiefly to the technical possibilities of various processes.

It was brought out that the production cost of gasoline in some types of coal hydrogenation plants is about 16c. per gallon; in Fischer coal process plants about 19c. This compares with a present cost of 5c. to 6c. per gallon in refining crude oil to make gasoline.

Witnesses at the Salt Lake City hearing, Aug. 9, voicing their approval of the bill's purposes, said the coal, oil-shale and oil-sand deposits in Utah, Colorado and Wyoming are the largest potential source of secondary oil in the United States and should be developed immediately to supplement natural oil supplies. B. P. Manley, secretary of the Utah Coal Operators' Association, however, said that operators objected to the proposal that the Secretary of the Interior sell the processed products at cost. This and absence of a limitation on production would jeopardize private enterprise, he said.

Hearings also were scheduled for Aug. 6 at the U. S. Bureau of Mines Experimental Station, Pittsburgh, Pa., and Aug. 11 at Sheridan, Wyo.

Two Blasts in Alabama Mine Kill 21, Injure 23

Twenty-one miners, including three volunteer rescue workers, were killed and 23 others were injured in the evening of Aug. 29 and early the following morning when two gas explosions rocked the Republic Steel Co.'s Sayreton No. 2 mine, Sayreton, Ala. Among the dead were E. J. McCrossin, chief State mine inspector; C. E. Saxon, U. S. Bureau of Mines; John Frame, assistant superintendent, Sayreton No. 1 mine; George Ferguson, mine foreman, and Will Neal, section foreman, who led rescue crews. It was said that 100 of the regular night shift of 135 men escaped to safety between the blasts, the first occurring at 10:30 p.m. and the second at 1 a.m.

Obituary

C. BASCOM SLEMP, 73, Big Stone Gap, Va., executive head of three coal concerns in eastern Kentucky, died Aug. 7 in a hospital in Knoxville, Tenn., where he had been taken three days previous. In 1907 Mr. Slemp succeeded his father, the late Campbell Slemp, in Congress from the Ninth Virginia District. He was re-elected several times and later became secretary to President Coolidge. When coal development began in eastern Kentucky Mr. Slemp was the chief organizer, being an incorporator in the Elkhorn Collieries Co., Farraday, Ky.; Elkhorn Jr. Coal Co., Millstone, Ky., and the Kentucky River Coal Corp., Lexington, Ky.

BART C. LEONARD, president of the Adams Fuel Corp., South Fork, Pa., died there Aug. 9. He had headed that company, which operates the Riverside No. 2 mine, for a number of years.

"Big Inch" Now Delivering Oil In East; Two Leaks Fixed

Crude oil flowing through "Big Inch," the 1,362 Texas to East Coast pipeline, began to pour into storage tanks at Marcus Hook, Pa., Aug. 15 after a small leak held up the flow through the 24-in. tube for several hours. The oil began splashing into the storage tanks of the Sinclair Refining Co. a few hours after midnight at the rate of about 100,000 bbl. a day, a third of the daily load which the line is expected to carry when in full operation. The leak, which occurred in the 20-in. branch between Phoenixville and Marcus Hook, was quickly patched by repair crews.

There was another break Aug. 19 in the 20-in. branch running from Phoenixville to Bayonne, N. J., which caused a huge gush at Doylestown, Pa., lasting more than twelve hours before being halted by an emergency crew.

A request for permission to construct a trans-New England pipeline from Albany to Boston was rejected Aug. 19 by the Petroleum Administration for War on the ground that it would not materially increase shipments of petroleum products. The line would have involved 114 miles of 10-in. pipe from Albany to West Boylston, Mass., and 51 miles of 8-in. pipe from there to Breeds Island in the Boston area, with capacities of about 50,000 and 30,000 bbl. daily, respectively. Ralph K. Davies, acting petroleum administrator, said that existing rail, barge and pipeline facilities were ample to move into New England its full, equitable share of the total available petroleum supplies, even in midwinter.

Shrinkage in Coal Production Mystifies British Authorities

A slump in British coal output averaging 241,500 tons a week in the four weeks ending Aug. 7 compared to the same period a year ago brought production to the lowest in two years, according to a government announcement Aug. 19. The average weekly output of salable coal in the four-week period was 3,097,800 tons. Of 25 districts in England, Scotland and Wales, only four—North and South Derbyshire, Leicestershire and Somerset—produced their quotas.

With no explanation for the slump, the authorities are reported to be somewhat at sea as to the cause of the consistent loss in headway by the industry. A year ago it was thought that lack of manpower was responsible for falling output, but injection of younger men has failed to effect any check in the backward trend.

A recent unofficial survey of Yorkshire mines led to the conclusion that the chief difficulties were lack of cooperation between the workers and operators, illegal stoppages, absenteeism, delay in the settlement of grievances and increasing weariness. Gwilym Lloyd George, Minister of Fuel, who has been absorbed in handling stoppages, grievances and absenteeism, said last April that although there were 5,000 more workers, the weekly production had

fallen by 100,000 tons and two months later told the House of Commons that the output for the quarter ending June 30 was 1,220,000 tons less than in the corresponding period of 1942 while the average number of wages earners was 900 more.

The British coal industry employs 706,000, of whom 545,000 are underground workers. The Labor Ministry aims to supplement these with 30,000 to 60,000, but against this is the normal shrinkage through death, injury and illness, which is expected to reduce the mining force to 660,000 by March, 1944.

Though Britain has coal in abundance, the latest announcement indicates there may be trouble if next winter is a cold one.

Mine Union Reentry in A.F.L. Left to October Convention

After three days' consideration the executive council of the American Federation of Labor decided in Chicago on Aug. 11 to sidestep responsibility for action on the application of John L. Lewis to bring the United Mine Workers back into the organization and voted to refer the problem to the A.F.L. convention in Boston in October without recommendations.

Although Mr. Lewis has threatened to withdraw his application for reaffiliation with the A.F.L. if the executive council refused to approve it, William Green, A.F.L. president, declared that the council had received no such word from Mr. Lewis and that the special committee appointed to deal with the application would be ready to continue negotiations with the United Mine Workers at any time before the A.F.L. Boston convention.

The principal stumbling block to approval of the Lewis application, according to Mr. Green, was the refusal by Mr. Lewis to consider disposition of "catch-all"

District 50, having members in many fields already organized by A.F.L. affiliates, and other jurisdictional problems until the miners' union had received a new charter in the federation. Another obstacle mentioned is the fact that the Progressive Miners of America, who now hold the coal miners' charter vacated by the U.M.W. when Mr. Lewis pulled them out of the A.F.L. in 1935 to found the C.I.O., refused to relinquish the charter to the U.M.W. The A.F.L. constitution requires written consent of any affiliate before a new union can be chartered in its jurisdictional field.

Mr. Green stated emphatically that some satisfactory relationship between the Progressives and the U.M.W. would have to be worked out before the Lewis union could be rechartered by the A.F.L.

Cut in Tax Assessments Sought By Hard-Coal Producers Denied

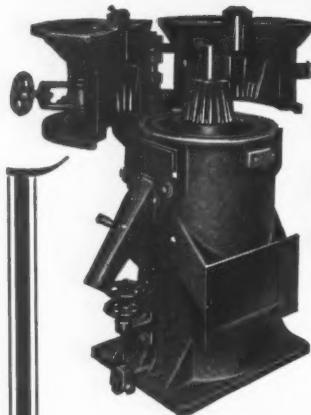
Luzerne County (Pa.) Tax Assessors Adrian Jones and Ben Rhys have denied requests for reduction of coal-land assessments of the Glen Alden and Lehigh Valley coal companies (Coal Age, August, p. 149).

In rejecting the appeals the assessors contended that new methods of assessment could not be used without approval of the Legislature or the courts. They also held that a claim that coal under river flood control dikes was no longer assessable was unwarranted because the government has taken only the surface of the company-owned property and not the coal. In answer to the contention that coal in built-up areas traversed by public highways cannot be removed and therefore is non-assessable, the assessors said that per-foot acre value was applied in such cases, making allowance for coal held in reserve.



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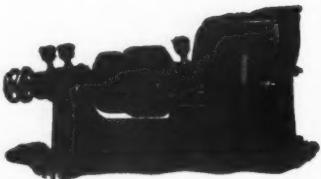
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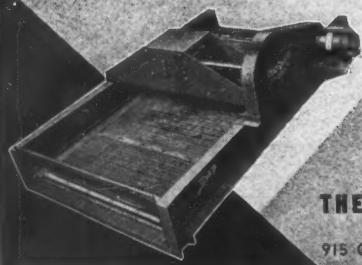


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Ultimate simplicity . . . proved ruggedness . . . easy and inexpensive to install . . . low power consumption . . . low upkeep . . . quick makeready and jacket replacement . . . all these combined with many constructional features make Leahy screens first choice of many mine operators.

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In reference to a contention that coal under Pierce St., Kingston, should not be assessed because of a lease agreement which permits only two-thirds of the coal to be mined the assessors held that a lease agreement cannot affect the rules of assessment of the board.

It was indicated at the time the requests for reduction in assessments were made that if the requests were turned down appeals would be taken to the county courts.

Bituminous Producing Costs Up 8.47c. Ton in First Quarter

Weighted average producing, administrative and selling costs for the nation's bituminous coal mines for the three months January through March, 1943, were \$2.3517, according to preliminary compilations submitted Aug. 24 to Secretary of the Interior Harold L. Ickes by the director of the Bituminous Coal Division. This figure, which excludes small truck operations, compares with \$2.2670 per ton for the calendar year 1942 (July Coal Age, p. 125). The weighted average cost per ton by districts follows:

Jan.-March 1943	
Dist. 1: Central Pennsylvania, Md., and part of Northern W. Va.	\$2.6420
Dist. 2: West. Penna.	2.5454
Dist. 3: No. West Virginia.	2.1208
Dist. 4: Ohio	2.1505
Dist. 5: Michigan	4.3680
Dist. 6: W. Va. "Panhandle"	2.2172
Dist. 7: So. W. Va., Va. "Smoke- less"	2.7358
Dist. 8: So. W. Va., Va., East Ky., part of Va., and Tenn.	2.4843
Price Area No. 1	2.4954
Dist. 9: W. Kentucky	1.5797
Dist. 10: Illinois	1.7403
Dist. 11: Indiana	1.6649
Dist. 12: Iowa	2.7148
Price Area No. 2	1.7302
Dist. 13: Alabama (Area 3)	3.0412
Dist. 14: Arkansas-Oklahoma (Area 4)	3.7453
Dist. 15: Missouri-Kansas-Oklahoma (Area 5)	2.0552
Dist. 16: No. Colorado	2.5173
Dist. 17: W. and So. Colorado, No. N. Mex.	2.8849
Dist. 18: Arizona-No. New Mex- ico	3.7261
Price Area No. 6	2.8224
Dist. 19: Wyoming-Idaho	2.0355
Dist. 20: Utah	2.4547
Price Area No. 7	2.1953
Dist. 22: Montana (Area 9)	1.3068
Dist. 23: Washington-Oregon (Area 10)	4.2137
Total, United States	\$2.3517

New Preparation Facilities

JEDDO-HIGHLAND COAL CO., No. 7 Colliery, Harleigh, Pa.—Contract closed with Wilmot Engineering Co. for one 7-ft. diameter Wilmot Hydrotator, capacity 65 tons per hour of No. 1 buckwheat coal; one 7-ft.-diameter Wilmot Hydrotator, capacity 40 t.p.h. of barley coal; one 6-ft.-diameter Wilmot Hydrotator, capacity 20 t.p.h. of No. 4 buckwheat coal.

How to Get a BETTER PRICE for YOUR COAL



Smart coal buyers demand clean
Coal—uniformly sized and
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RHOADS CONTRACTING CO., Park No. 1 Breaker, Park Place, Pa.—Contract closed with Wilmot Engineering Co. for one 6-ft.-diameter Wilmot Hydrotor; capacity, 45 t.p.h. of No. 1 buckwheat coal.

Commercial Standard Proposed For Forced-Air Furnaces

A proposed commercial standard for solid-fuel burning forced-air furnaces, TS-3536a, dated Aug. 2, is being circulated by the National Bureau of Standards, Washington, D. C., for consideration and acceptance if it meets with approval of "producers, testing laboratories, distributors and users."

Circulated "pursuant to a request from the Federal Housing Administration, and with the endorsement of the National Warm Air Heating and Air Conditioning Association," the Bureau requests that if the proposal is considered constructive and of benefit to those concerned, approval be indicated by signing and returning an accompanying acceptance form.

Rescue Service Organization Outlined in OCD Plan

Plans for organization of the Rescue Service, which is responsible for recovery of persons trapped under structural debris of demolished buildings in the event of enemy action, have been issued by James M. Landis, Director of the U. S. Office of Civilian Defense, in Operations Letter No. 133.

To guide the development of a trained Rescue Service in the United States Citizens Defense Corps, an engineer officer of the U. S. Public Health Service, Simon H. Ash, formerly of the U. S. Bureau of Mines, has been designated chief of the Rescue Section of the Medical Division of OCD. Mr. Ash recently returned from a month's visit to Britain, where he studied the British rescue organization and training methods. Other mining engineers with rescue experience and also commissioned in the U. S. Public Health Service are being assigned to the Civilian Defense regions in the target areas as rescue officers to assist States and local communities in organizing and training the Rescue Service.

The plan calls for State chiefs of Rescue Service, who should be mining or civil engineers familiar with mining or construction work, according to the recommendations. Local chiefs may be qualified safety engineers or structural experts trained in rescue work.

Although the Rescue Service is being organized nationally under the direction of the Medical Division of OCD, State and local Rescue Services will be separate from the Emergency Medical Service. Local chiefs of rescue and emergency medical services will work in close coordination in the control center. When reports are received of persons trapped by debris of buildings demolished by an air raid or other enemy action, an express party is dispatched, which consists of one rescue squad, one mobile medical

team, and one ambulance and one sitting case car.

Rescue workers, who should be recruited from workers in the building and demolition trades, mine workers, mechanics, petroleum industry workers and tunnel workers in the heavy construction industry, are to be organized in squads of ten. The squads should be based in depots, each of which should have a complement of three squads rotating on periods of first call.

The OCD recommends an average of one depot for each 50,000 population in target areas. The number in each locality, however, will depend on the type of buildings and on the area over which the community is spread, as well as on the number of residents. The national program contemplates an establishment of about 1,000 depots and a full rescue personnel of 30,000 organized into 3,000 squads.

Training for rescue squads will include special technical instruction and drill ranging over all classes of rescue problems and, in addition, practice in advanced first aid and handling of the injured. The Medical Division now has in press two publications, "Technical Manual for the Rescue Service" and "Emergency Field Care and Transportation of the Injured," which will be used as training manuals. Advanced training in these subjects will be pursued after squad members are inducted into the U. S. Citizens' Defense Corps. Pre-induction training includes a basic course in first aid.

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Hercules Augers

Ideal for modern high speed electric drills—withstands whips and torsional strains. Flint hard and tough as whalebone. Drills faster—drills more holes with resharpening—outlasts four to five ordinary drills. Recommended for the hardest jobs. Up to 3" diameters—up to 16 ft. in length.

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Carefully made from high-carbon crucible grade steel—heated-treated to obtain as much hardness and toughness as possible, to prevent broken tangs and points. Furnished up to 2" diameters—maximum over-all lengths 16 ft.

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Originally developed for use with hand drills. These augers work best at hand drilling drilling holes under stumps, and ditch blasting. Up to 2" diameters from oval steel, $\frac{7}{16}$ " thick, and maximum length of ten ft.

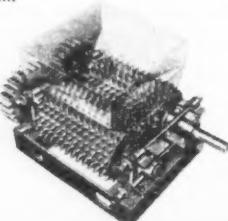
Call on us for any type auger you may require in your operations. We specialize in manufacturing the better grade alloy, heat-treated augers. Write, wire or phone for details concerning sizes, prices, deliveries, etc.

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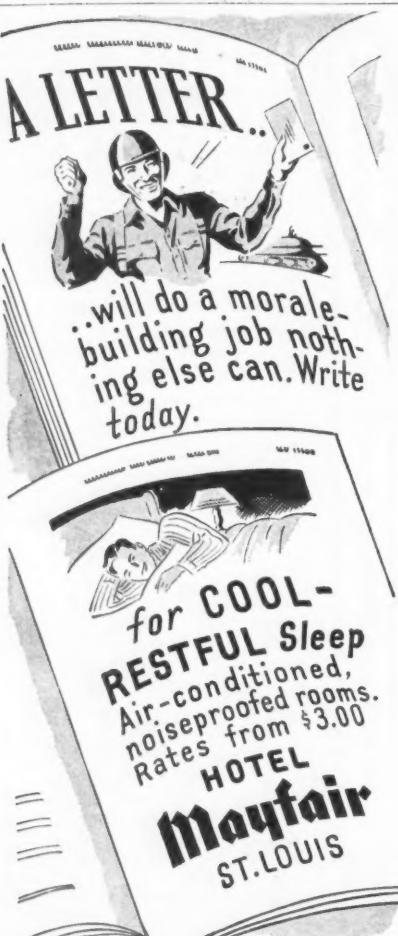


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The Office of Civilian Defense is preparing to conduct within a few weeks a pilot Rescue Service Training School in collaboration with the U. S. Bureau of Mines at Pittsburgh; another will be held later at San Francisco. Chiefs of rescue services in States and large cities in target areas will be trained in these pilot schools, and they in turn will establish State and local schools for training other Rescue Service personnel.

5,801 New Freight Cars Announced by ODT

The Office of Defense Transportation announced Aug. 11 that it has found it possible to provide for the construction of an additional 5,801 new freight cars in 1943 out of steel allocated to the railroad industry for the third quarter. The addition of the 5,801 new cars to those already authorized will mean that upward of 32,000 new freight cars will be produced this year, ODT officials declared. The latest addition will include the following types: box, 2,724; gondola, 262; hopper, 2,150; refrigerator, 300; flat, 365.

Many of the principal car builders and some railroad shops will participate in the construction of the new equipment, it was pointed out. The list of builders and the number of units each will build is:

American Car & Foundry, 1,402; Bethlehem Steel, 500; Fruit Growers Express, 300; General American Tank Car Co., 1,100; Greenville Steel Car Co., 165; Mather Stock Car Co., 62; Mount Vernon Car Mfg. Co., 200; Pullman Standard Mfg. Co., 1,092; Milwaukee shops, 300; Burlington shops, 330; Reading shops, 200; and St. Louis Southwestern shops, 150.

To Move Association Offices

Headquarters of the Southern Wyoming Coal Operators' Association were to be moved from Cheyenne to Rock Springs by about Sept. 1, it was decided at the last meeting of the group, when John Lucas, president, Rock Springs Fuel Co., was elected president of the association. Other new officers named include: vice president, T. J. O'Brien, president, Kemmerer Coal Co., and vice president, Gunn-Quaely Coal Co.; treasurer, W. J. Thompson, president, Colony Coal Co.

Fred Thayer, who has been serving as executive secretary of the association, which office has been abolished, said the transfer of headquarters was to put the offices closer to centers of major production in southern Wyoming.

Amherst Has 50th Birthday

Felicitations are flowing in to the Amherst Coal Co., Amherstdale, W. Va., which is celebrating its golden jubilee, having been founded in 1893. In announcing the event, Herbert E. Jones, president of the company, wrote the following message to Amherst employees:

"On July 12, 1943, our Red Star mine celebrated a half century of continu-

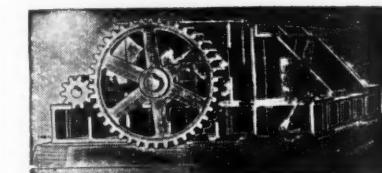
BEHIND THE GUN

... and behind the machine, men have learned to depend on Coffing Hoisting Equipment. Rugged — dependable and economical. All Coffing ratchet lever hoists are tested up to 100% over rated capacity. Illustrated is model ATG "Safety Pull" ratchet lever hoist. Write today for Catalog GG 6.

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With this advanced design, in rugged STEELBUILT construction, far more accurate sizing is possible to meet Code requirements through quick adjustability, in a range from $\frac{3}{4}$ " to 8".

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ous operation. This is the only mine on the Chesapeake & Ohio Ry. that has operated continuously for 50 years and under the same family ownership and management. Having produced millions of tons of highest quality Sewell seam coal, its product has helped sail our Navy on the seven seas, turned the wheels of industry in times of peace and war, and has provided its cheery warmth in countless thousands of homes. We feel that the record established by our Red Star mine is a monument to the stability which characterizes free American enterprise."

Miners Rescued From Flood By Surfboard

Rescue by surfboard of six Pennsylvanians from a flooded mine shaft on July 29 is hailed as pointing the way toward extension of American Red Cross water-safety techniques to the field of mine safety.

A generation ago Dr. Matthew J. Shields, of Jermyn and Scranton, Pa., pioneered a first-aid movement which, through the U. S. Bureau of Mines and the American Red Cross, has affected every mining community in the nation. Just as Dr. Shields proved that first aid would save lives in the disasters that were common in the mines of his day, so did John J. Komp, of Pittsburgh, a few weeks ago show that water safety principles could cheat death in a type of mine disaster which, fortunately, is not common.

On July 27 the six men of the Ollett Coal Co.'s night shift—and their mule, Queenie—were trapped by waters of a flash flood resulting from rain so heavy that the retaining wall protecting the mine was unable to withstand the water's pressure. The water had rushed in to a depth of 300 ft., trapping Fireboss Henry Reinhardtler, Pete Carroll, Albert Long, Frank Albertini, Caesar Rua and John Bonassi—and Queenie.

The plan of attempted rescue—if the men were still alive—was to pump the mine dry enough for relief workers to get in or for the miners to wade out. Sufficient equipment and electric current were not available immediately, however, and lack of clearance between the water and the mine roof did not permit the use of a canoe or raft.

On July 29, after more than 40 hours, E. E. Quenon, of the U. S. Bureau of Mines, swam into the mine and found the men calmly awaiting rescue, sitting on a ledge above the water level. None of the men could swim, so they were unable to follow him to safety. For 20 ft. there was only 6 in. of clearance between the water and the mine roof, so use of a boat still was impossible.

Because of the danger from exposure and the tension of anxious relatives waiting at the mine entrance, it was decided that it would be risky to wait the additional hours necessary for lowering the water level by pumping. Mr. Komp, who never before had been in a mine, offered to effect the rescue by surfboard.

First he made five trips, carrying soup and coffee to the hungry men. He had taped a flashlight to the bow of his surf-

board and put thermos bottles on top. For the 20 ft. of 6-in. clearance he had to hold the bottles under water.

Then Komp, swimming with his feet, brought the men out, one by one. He held each man by the wrists. The men had only their arms on the board, as there was no room for their bodies to clear. Komp had one bad moment, when the second man to be removed caught his head between the board and the roof.

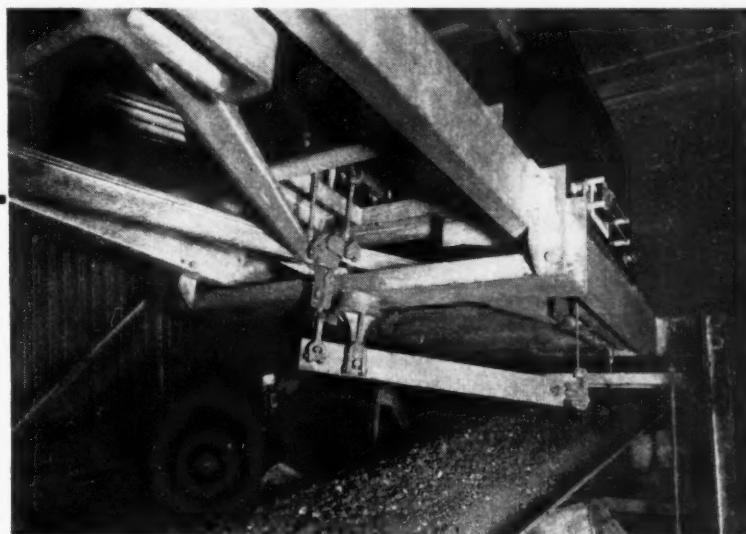
Eleven round trips were made altogether, in about 2½ hr.—five for food and one for each of the six men. Queenie came out later—not on the surfboard.

Mr. Komp now is on leave as assistant executive director of the Pittsburgh chap-

ter of the American Red Cross. A few days after this rescue he reported to Red Cross headquarters at Washington, whence he was scheduled to go to the Caribbean, in charge of the Red Cross functional swimming work with the armed forces.

To Move Sharondale Tipple

Premier Pocahontas Collieries Co., Premier, W. Va., preparing to make a new opening in the Davy Sewell seam, is about to move a tipple from Sharondale, Ky., to the new operation. After reerection and modernization, the structure, which has been idle since 1931, will have a daily capacity of 1,500 tons.



Installed at Marion Generating Station, Jersey City, N. J. Public Service Electric & Gas Co.

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Readily installed with any belt conveyor system, the Builders Toledo Chronoflo Conveyor Weigh Meter accurately weighs coal in transit. It eliminates guesswork . . . is giving highly accurate and dependable results in many installations, large and small. For automatically and continuously proportioning and blending materials, two or more units can be used in combination.

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FULLY AUTOMATIC control of Wilmot Hydrotators makes anthracite preparation by this method a mere mechanical process. Wartime manpower problems are solved by the "invisible crew" that operates



Hydrotators with complete assurance of uniform high quality.

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THE COAL INDUSTRY
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OPA Probe Finds Mining-Area Stores Obeying Price Laws

The Office of Price Administration reported on July 30 that as a result of a compliance drive in coal-mining areas in Pennsylvania, West Virginia, Kentucky, Illinois and Alabama price violations in food stores have been largely eliminated. The report also revealed that in general prices in the mining areas, both among independent and company stores, were comparable with and in some instances lower than in the larger towns and cities.

OPA's action followed a preliminary check-up which disclosed that food prices charged in mining communities were averaging 5 percent above ceiling prices. This same check-up (June Coal Age, p. 124) gave company-owned stores as good or a better rating than independent stores.

OPA has instituted 100 suspension orders against stores in West Virginia and Pennsylvania and has closed 60 cases, with violators being penalized by suspension of sales for anywhere from 1 to 60 days. Most penalties were from 10 to 15 days.

Government investigators reported the following conditions in various coal mining areas:

Altoona, Pa.—Of 338 stores in 65 communities, 188 were checked in a six-county area serving 210,500 persons. Investigators visited 161 independent stores and 26 company stores and reported 24 percent of the items in the former were being sold above the ceiling price and 26 percent in the latter. In some cases suspensions of sales of rationed commodities were or-

dered, and in 95 cases warnings were issued. Twenty-five minor violations were settled without formal enforcement. Since then, the district rationing board has reported that "an excellent state of compliance exists."

Pittsburgh, Pa.—Investigators checked on 284 retail stores serving an area housing 341,128 persons, 210 of them independent and 74 either chain or company owned. They found 16.6 percent of the items checked were sold above the ceiling price. So far, 33 suspension hearings have been held, with penalties ranging from 2 to 30 days. The district OPA office said its investigators expressed the opinion that "generally compliance of the stores in the mining communities was very good compared with that of stores in the larger towns and cities."

Northern West Virginia and Lexington, Ky.—In the Lexington area, investigators said they were "very much surprised to find that prices in the coal communities were much lower than those in Louisville." Ten suspension-order proceedings have been started, 73 warnings issued, and 8 injunction suits begun. In Charleston, W. Va., the OPA reported 73 warnings issued and after a recheck found only three stores not obeying the ceiling regulations. Eight injunction suits and eight suspension orders have been instituted in the Wheeling area as a result of the investigation there.

Birmingham, Ala.—The OPA district office had only this to say of retail stores in this area: "All prices in all company stores in the Birmingham district are now in compliance." Enforcement actions were taken against 66 stores.

MIGHTY MIDGET DUSTRIBUTOR



Wheeled into position with the speed of fire department laddies. A sack of dust dumped into hopper and in 5 minutes, 160 lbs. of distributed rock dust kills the danger of coal dust like frost kills the bloom. Can supply permissible or dust proof; A.C. or D.C. any voltage.

Can be conveyed on coal car, shuttle car, special cart, and on some conveyors. Steel tires on cart through duration.

Overall Length	45"	Overall Width	22"
Motor	2 h.p.	Overall Height	18½"
Motor r.p.m.		3450	
Hopper Capacity—1 sack		80 lbs.	
Dust Delivery	(More than a ton per hour)	34 lbs. per minute	
Weight, Net280 lbs.	
Shipping Weight300 lbs.	
Static Pressure		11.4 inches	



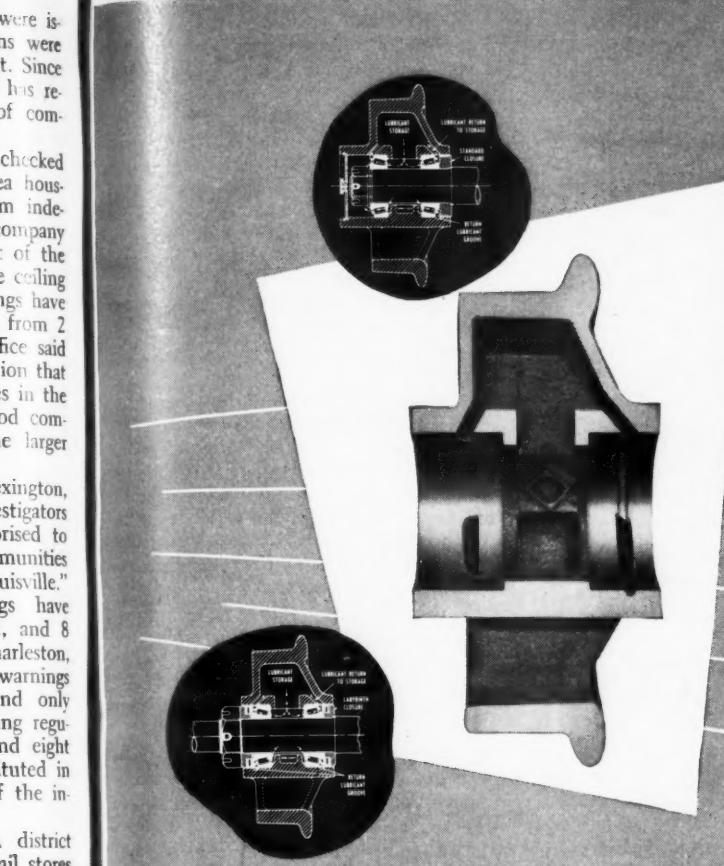
A demonstration will be made at your mine if you request it.

AMERICAN MINE DOOR CO.
2057 Dueber Avenue

Plans for Briquetting Plant In Illinois to Proceed

Plans for construction of a St. Clair County (Ill.) plant for briquetting coal from mines in the Belleville district, halted in the first week of August by the opinion of Kevin Kane, County Civil Attorney, that the county could not legally issue revenue bonds for the purpose, will be continued, John Doer, of Dupo, chairman of the Coal Processing Committee of the St. Clair County Board of Supervisors, announced. He said the attention of the committee had been called to a recent amendment to the Illinois Mines and Miners Act that may be interpreted as authorizing the county to issue such bonds. A full report of the legality of the expedient, he said, would be made to the board at the regular Sept. 14 meeting.

The plant, which is actively urged by the St. Clair-Madison Coal Operators' Association, would make possible the processing of coal acceptable under the St. Louis anti-smoke ordinance. The plan calls tentatively for a \$200,000 plant. The Reconstruction Finance Corp. has indicated a willingness, it is reported, to finance half the cost of the plant if the county or coal operators provide for the remainder of the money. Under the bond plan, the county would redeem its bonds from revenue obtained through the plant.



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get longer wheel life...
with
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CORRECT DESIGN. Hockensmith "Oilspok" wheels are designed with correct proportioning of the tread, hub, and spokes for maximum strength plus an ample margin of safety.

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PRECISION MACHINING. Specially designed machines insure tread being concentric with the bore, and hubs being machined to exact limits—important steps in the manufacture of a good wheel.

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O I L I S A M M U N I T I O N , U S E I T W I S E L Y

Bituminous Coal Research Plans New Program

Julian E. Tobey has been reappointed chairman of the technical advisory board of Bituminous Coal Research, Inc., it was announced Aug. 2 by Howard N. Eavenson, B.C.R. president, who made the appointment following the board's nomination of Mr. Tobey at its meeting at Battelle Memorial Institute, Columbus, Ohio, July 21. As chairman of the technical advisory board of the bituminous coal industry's research agency, Mr. Tobey will continue his leadership of this body, which has active direction of the industry's research program aimed at the improved and increased use of coal in residential and industrial applications. He also continues as chairman of the technical executive committee; he has held both positions since the board was organized in March,

1941. Mr. Tobey, managing director of the Coal Bureau of the Upper Monongahela Valley Association, Chanin Building, New York City, is a noted fuel engineer, specializing in coal utilization.

To facilitate the handling of an increasing number of B.C.R. research projects, each requiring careful consideration and discussion with the Battelle engineers who conduct the research, subcommittees were appointed by Mr. Eavenson on hand-fired heating equipment, residential stokers, dustless treatment, railroad locomotives, gasification and carbonization.

Henry F. Hebley, director of research of the Pittsburgh Coal Co., Pittsburgh, Pa., was selected chairman of the subcommittee on dustless treatment, which will continue to advise the research on the use of calcium chloride and other non-petroleum products that may show promise for allaying dust on coal.

C. F. Hardy, manager, fuel engineering division, Appalachian Coals, Inc., Cincinnati, Ohio, was appointed chairman of the newly formed subcommittee on hand-fired heating equipment, which will report on projects concerned with developments on smokeless stoves and water heaters, and household furnaces.

Chairman of the gasification and carbonization subcommittee will be E. J. Kerr, fuel engineer, Island Creek Coal Sales Co., Huntington, W. Va. This division will direct its attentions to the experiments about to be started on converting the carbonaceous substances of coal into gas suitable for fuel.

A fourth subcommittee was named to deal with industrial utilization. It is to be headed by Vernon G. Leach, chief fuel engineer, Peabody Coal Co., Chicago. Among its principal interests are the use of pulverized coal in industrial forge and steel-treating furnaces. Coal can replace oil and gas for these purposes, it has been shown, thus prolonging the reserves of the latter fuels.

Residential stokers, the fifth subcommittee, will be directed by Fred K. Prosser, coal traffic manager, Norfolk & Western Ry., Roanoke, Va. A household stoker is under development at Battelle for B.C.R., which is designed to accomplish both in bin feeding of coal and automatic removal of ash, with ability to burn a wide range of coal types.

The subcommittee on railroad locomotives, with J. E. Tobey as chairman, is charged with the responsibility of encouraging the development of steam locomotives that will utilize bituminous coal more effectively and efficiently.

In addition to those named to chairmanships of subcommittees, other members of the technical advisory board are:

Paul Barkman, Cleveland Cliffs Iron Co., Cleveland, Ohio; Charles B. Baton, Baton Coal Co., Pittsburgh, Pa.; Eugene D. Benton, Louisville & Nashville Ry., Louisville, Ky.; Fred H. Bird, Binkley Coal Co., Chicago; Minott Brooke, Chesapeake & Ohio Ry., Huntington, W. Va.; Thomas C. Chasley, Sinclair Coal Co., Kansas City, Mo.; Joseph D. Doherty, Koppers Coal Division, Pittsburgh, Pa.; Howard N. Eavenson, Bituminous Coal Research, Inc., Pittsburgh, Pa., ex officio; Homer M. Faust, New York Coal Sales Co., Columbus, Ohio; Howard A. Herder, Sahara Coal Co., Chicago.

E. S. Pugh, Raleigh Smokeless Coal Co., Beckley, W. Va.; Earl C. Payne, Consolidation Coal Co., New York; Charles J. Potter, Rochester & Pittsburgh Coal Co., Indiana, Pa.; Chester A. Reed, National Coal Association, Washington, D. C., ex officio; Carl Scholz, Carbon Fuel Co., Charleston, W. Va.; John Scott, New River Co., Mt. Hope, W. Va.; Larry A. Shipman, Southern Coal & Coke Co., Knoxville, Tenn.; R. Frank Stilwell, Red Jacket Coal Sales Co., Columbus, Ohio; R. L. Sutherland, Truax-Traer Coal Co., Minneapolis, Minn.; J. C. R. Taylor, Virginian Ry., Norfolk, Va.; Allen W. Thorson, Carnegie Institute of Technology, Pittsburgh, Pa., ex officio; Max A. Tuttle, Knox Consolidated Coal Corp., Indianapolis, Ind.; and R. B. Williamson, Eastern Coal Sales Co., Bluefield, W. Va.

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Plenty Tough . . .

but it still needs Lubrication

Wham! The bouncing jeep refuses to be stopped. And one big reason is: The boys keep it in fighting trim with *regular lubrication*. Give your wire rope the same care and its resistance to destruction will also be something to talk about.

When wire rope leaves the factory it is lubricated clear through. Inside wires bear on each other with minimum friction as they bend around drum or sheave. If it's a hemp center rope, the saturated core feeds more lubricant to wires and strands as loads are applied. The lubricant on outer wires checks dirt and moisture, too.

But weather, pressure, heat and corrosion will eventually exhaust the protection

unless the lubricant has been *renewed* in time. A dry core or rusted inner wires won't be visible to the eye. So, if it's sound to "grease" jeeps and trucks at stated intervals in order to *prevent* damage, it's sound to do the same for wire rope.

A good lubricant penetrates to the core and still has viscosity to cling to individual wires. Major oil companies make excellent products for this purpose. Get a supply and use it regularly. If you wish detailed lubrication instructions or any other assistance in conserving rope, feel free to call on B & B engineers. Remember . . . Uncle Sam will thank you for making your wire ropes *last longer*.

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to chair- er mem- board are: riffs Iron B. Baton, ; Eugene ville Ry., Binkley e, Chesa W. Va., Coal Co., Doherty, rgh, Pa.,ous Coal ex officio, Coal Sales A. Herder,

less Coal C. Payne, w. York, Pittsburgh A. Reed, Washington, Carbon Fuel m. Scott, W. Va.; al & Coke Stilwell, Columbus, Traer Coal R. Taylor, Allen W. Technology, A. Tuttle, Indiana, Eastern Va.

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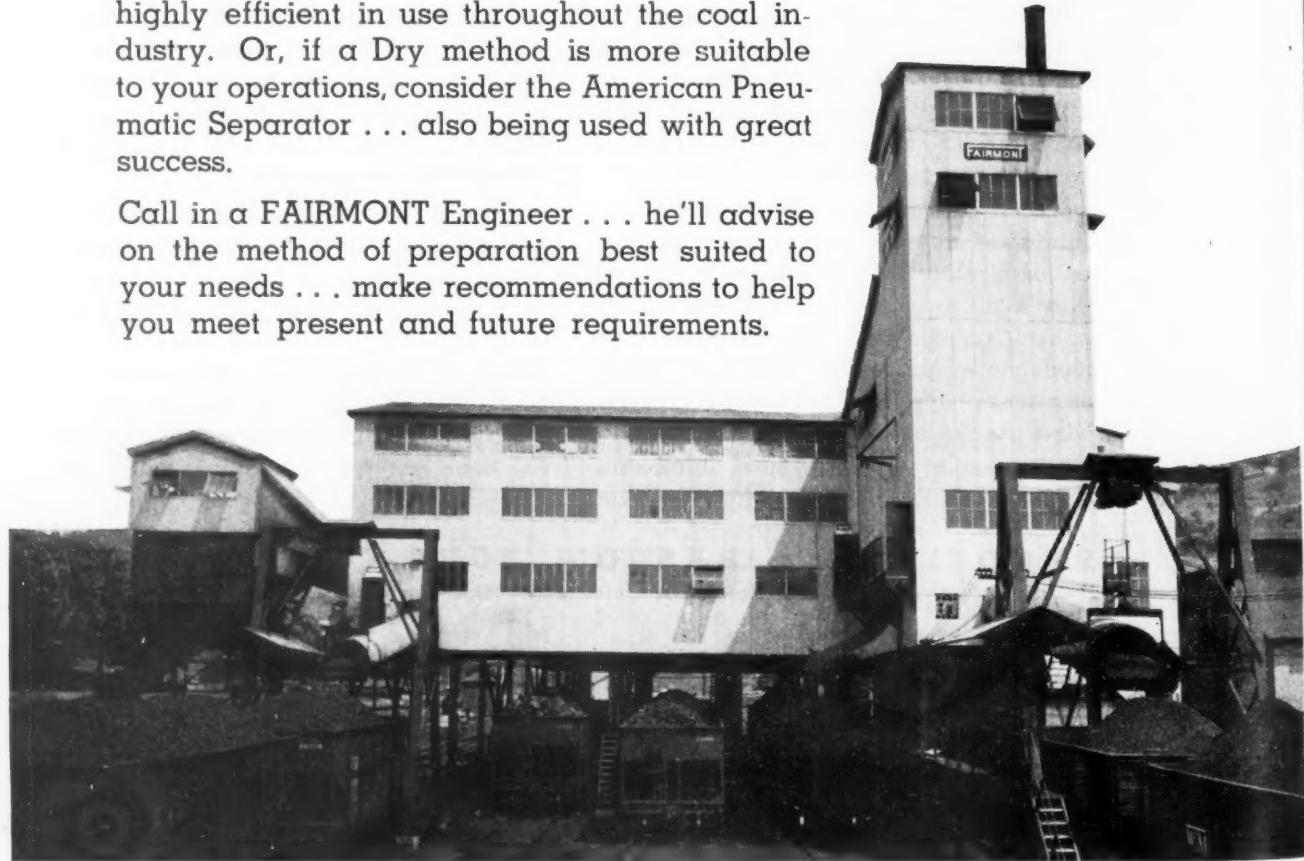
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• **A**LL signs point to a bright future for coal . . . new uses for coal in production of plastics, explosives, rubber, pharmaceutical chemicals, dyes and organic chemicals will increase demands to an extent never before realized. And, parallel to this growth will be an ever-increasing demand for scientifically prepared coal . . . coal of a quality to meet chemical and metallurgical requirements in these new fields. Thus, it is important that you plan accordingly . . . make certain that your coal, properly prepared, will compete successfully in tomorrow's markets.

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Avoid costly shut-downs that seriously hamper production. Thoroughly check and examine all of your equipment now to be sure it is ready for a long hard winter, or better yet, send for a Holmes Engineer to give your plant a complete check-up. He will be glad to give you recommendations based on years of practical experience.

In going over your plant use this list, checking items needing repairs or replacements

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SPROCKETS	<input type="checkbox"/>
CHAINS	<input type="checkbox"/>
FLIGHTS	<input type="checkbox"/>
PANS	<input type="checkbox"/>
BEARINGS	<input type="checkbox"/>
SHAFTING	<input type="checkbox"/>

HOISTS

DRUMS	<input type="checkbox"/>
SHAFTING	<input type="checkbox"/>
SPIDERS	<input type="checkbox"/>
MOTORS	<input type="checkbox"/>
ENGINE PARTS	<input type="checkbox"/>
CABLES	<input type="checkbox"/>

RETARDERS

DRUMS	<input type="checkbox"/>
SHAFTING	<input type="checkbox"/>
BEARINGS	<input type="checkbox"/>
CABLES	<input type="checkbox"/>

ELEVATORS

SPROCKETS	<input type="checkbox"/>
CHAINS	<input type="checkbox"/>
BUCKETS	<input type="checkbox"/>
CASING	<input type="checkbox"/>
BEARINGS	<input type="checkbox"/>
SHAFTING	<input type="checkbox"/>

SHAKERS

SCREENS	<input type="checkbox"/>
HANGERS	<input type="checkbox"/>
BEARINGS	<input type="checkbox"/>
SHAFTING	<input type="checkbox"/>
ECCENTRICS	<input type="checkbox"/>
DRIVES	<input type="checkbox"/>

GAGES

BAIL	<input type="checkbox"/>
PLATFORM	<input type="checkbox"/>
SHEAVE WHEELS	<input type="checkbox"/>
SHAFTS	<input type="checkbox"/>
BEARINGS	<input type="checkbox"/>

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Starting September 9th, your Government will conduct the greatest drive for dollars from individuals in the history of the world—the 3rd War Loan.

This money, to finance the invasion phase of the war, must come in large part from individuals on payrolls.

Right here's where YOUR bond selling responsibilities DOUBLE!

For this extra money must be raised *in addition* to keeping the already established Pay Roll Allotment Plan steadily climbing. At the same time, every individual on Pay Roll Allotment must be urged to dig deep into his pocket to buy *extra* bonds, in order to play his full part in the 3rd War Loan.

Your now doubled duties call for these two steps:

1. If you are in charge of your Pay Roll Plan, check up on it at once—or see that whoever is in charge, does so. See that it is hitting on all cylinders—and keep it climbing! Sharply

increased Pay Roll percentages are the best warranty of sufficient post war purchasing power to keep the nation's plants (*and yours*) busy.

2. In the 3rd War Loan, every individual on the Pay Roll Plan will be asked to put an *extra two weeks salary* into War Bonds—over and above his regular allotment. Appoint yourself as one of the salesmen—and see that this sales force has every opportunity to do a real selling job. The sale of these *extra* bonds cuts the inflationary gap and builds added post-war purchasing power.

Financing this war is a tremendous task—but 130,000,000 Americans are going to see it through 100%! This is their own best *individual* opportunity to share in winning the war. The more frequently and more intelligently this sales story is told, the better the average citizen can be made to understand the wisdom of turning every available loose dollar into the finest and safest investment in the world—United States War Bonds.

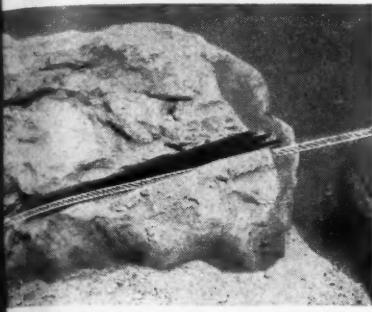
BACK THE ATTACK  With War Bonds!

This space is a contribution to victory today and sound business tomorrow by COAL AGE

9 Important Factors That Affect Wire Rope Life

Some years ago, a lad came into the country crossroads store and announced sadly that his pet dog had died. "Too bad, son," consoled the storekeeper. "Did he have a dog doctor?" "No sir," answered the lad, "he just died by himself."

Your wire rope may end up that same way. It too can die by itself because of lack of care or attention. But you can help



our ropes "live" longer... and that is most important today... by consulting a trained and experienced wire rope engineer. Macwhyte engineers (rope doctors) are always glad to be of assistance.

Then there is another thing you can do. By knowing what the most common "rope abateurs" are, by taking precautions against them yourself, you can improve our wire rope service.

9 Factors Affecting Service

There are many factors affecting the life of wire rope, but the following nine are the most common.

- | | |
|----------------------------|------------------------|
| Abrasion or wear | 5. Crushing or mashing |
| Bending or flexing | 6. Jerking or shock |
| Tension or stress | 7. Vibration |
| Speed | 8. Heat or friction |
| 9. Weathering or corrosion | |

In reviewing these factors, we realize that some of them are normal and to be expected, but they are, nevertheless, included because all factors need to be checked and watched to see that they do not become abnormal.

The first four listed, for example, are normal when not excessive for the particular job, equipment, size and construction of rope used. The other five are abnormal and where they exist, they should be cor-

rected if at all possible. Many working ropes are exposed to from 3 to 5 of these factors at one time.

What can the wire rope user do about them? Here are a few simple suggestions... things you can watch for, simple changes you can make.

1. Abrasion or wear

All operating ropes are subjected to abrasion as a normal part of their duty, but some abrasion is due to neglect. Watch for the causes of abrasion that may be avoided, such as scraping wire rope along the ground, pulling wire rope over sharp edges and, as illustrated (left), allowing wire rope to create a sawing action on rock or other materials. Here we see a deep channel cut into the rock by continuous and frequent contact of the wire rope with the rock as it operated back and forth.

2. Bending or flexing

Too small sheaves and reverse bends are the worst offenders to rope life. Here you see an example of what excessive bending can do. This rope was run over



sheaves that were too small. The results are broken wires, ruined rope.

Watch for broken wires. Inspect your sheave diameters and check to make sure you have the wire rope construction best suited for flexibility and to meet other conditions of your operation. Where sheaves of necessity are smaller than that recommended, use PREformed wire rope.

3. Tension or stress

All wire rope is subjected to tension or stress, but the problem here is to see that the rope is not overstressed for its size and construction. In some cases, it has been found that a larger rope reduces the stress or pressure and prevents the rope from stretching beyond its elastic limit for which it was designed. Consequently, longer service will be obtained on some installations by increasing the size of the rope.

To obtain the best service from wire

rope, it should not be operated beyond the recommended safe load which is a fraction of its ultimate strength and varies for different types of service, as explained in other articles in this series.

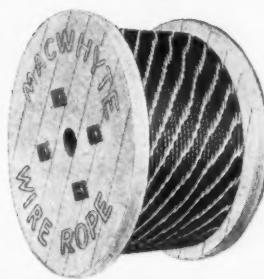
4. Speed

Generally speaking, the greater the speed of operation, the less service that can be expected from wire rope. High speed operation, such as on mine shaft hoists, high speed elevators, and cableway hoisting equipment, requires larger sheaves than recommended for other uses, in order to get the best life out of the rope. Speed is a definite factor affecting wire rope life, and is worthy of study if the best service is to be obtained.

Space does not permit a discussion of the remaining factors in this article; these will be covered later.

In these days of need for wire rope conservation, always feel free to write to Macwhyte Company, state your problems or what information you would like to have and Macwhyte engineers will be glad to give you the benefit of their advice and counsel.

This is Number 17 in a series of informative articles on how to get the most out of wire rope. It is directed to those who want to do everything they can to lengthen wire rope life and conserve steel. All articles in the series are available on request.



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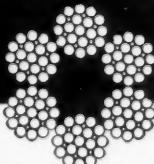
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Keep on striking while the Iron is hot

The continuous, tremendous blows that the Allies are delivering daily will some day accomplish what we are all longing for—the end of the War.

It is imperative that there be no loss of effort by Industry anywhere. Let every worker realize the necessity of giving full effort every working day to keep the arms, munitions, food and all supplies moving constantly to wherever our Armed Forces need them.

INDUSTRIAL RUBBER GOODS

Have you ever seen a list of rubber articles that is necessary to keep the vast War machine in smooth operation? Surely a most imposing one.

The Rubber Manufacturers, by their whole-hearted effort and an initiativeness that is unparalleled, have an Industry that is turning out vast supplies which, until a short time ago, would have been considered impossible.

Various officials of many branches of the Government have recognized and acknowledged the magnificent part the Rubber Industry is taking in the War Program.



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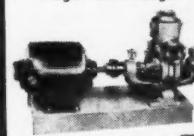
Type AD Hor. Split Case, Two Stage Centrifugal



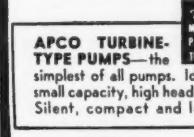
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Close-Coupled
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Crushing coal at a total cost of less than one cent per ton, including power, labor, maintenance, and interest on investment is an everyday achievement for American RING Crushers, year in and year out.

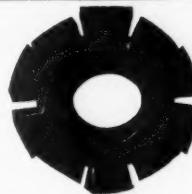
This low-cost-per-ton for crushing is explained by the fact that centrifugal force is used at right angles to a horizontal shaft, i. e., the material enters the crusher from the top, falls on and is struck, by the rings in suspension, which action shatters and splits the coal before it reaches the breaker and grinding plates.

The American Rolling Ring Crusher is built in many sizes. Each unit is arranged to meet the particular requirements of each application—each is compact, externally adjusted, easily accessible.



Coal is split instead of crushed
Reversible Manganese Steel Shredder Rings
reduces fines to a minimum

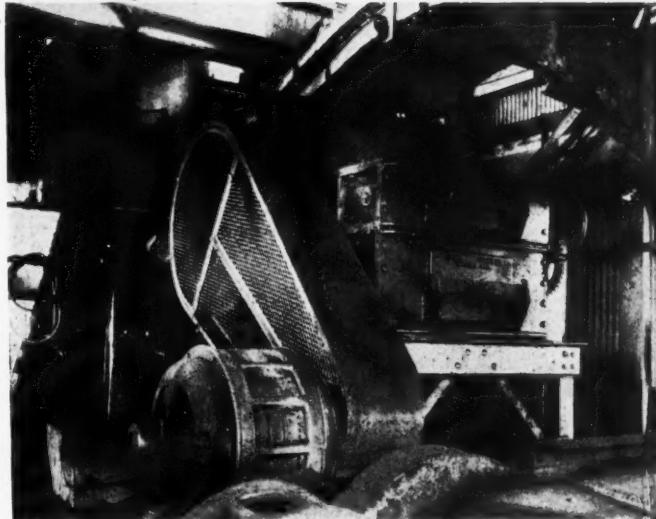
This patented feature is found only in the American Rolling Ring Crusher. It splits the coal instead of crushing it, thereby assuring a uniform size of crushed coal. An adjustable grinding plate makes it possible to secure properly sized coal for either stoker or pulverized coal burning. The crusher can be adjusted to make either a maximum or minimum amount of fines.



PATENTED

The crushing parts are: breaker plate, grinding plate, grate bars, and rings which weigh about 27 lbs., made of manganese steel. It applies centrifugal force at right angles to a horizontal shaft.

The rings roll as they grind. They are "thrown-back" when they encounter non-crushable material, protecting the crusher from damage by foreign materials. This flexibility or "give" makes the crusher self-acting against tramp material.

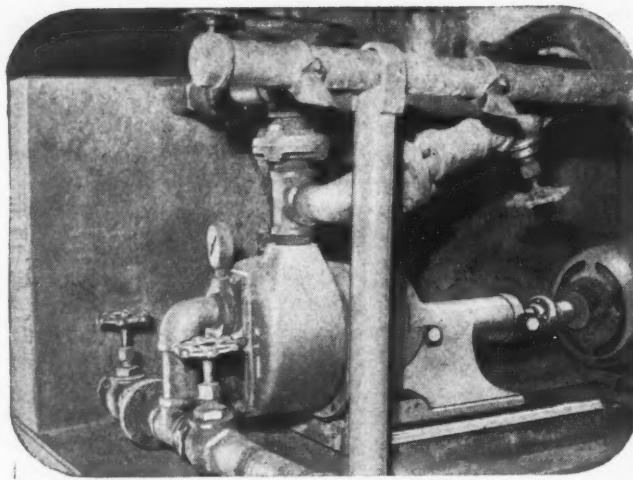


American Ring Crusher, type AC-3A, driven by a 100 h. p. motor, crushing washed coal in a preparation plant.

IMPORTANT BENEFITS

- 1 Its dependable operation saves on maintenance
- 2 The splitting action of our patented Manganese Steel Shredder Rings reduces fines to a minimum—the coal is split instead of being crushed
- 3 Another result of this splitting action is a reduction of power requirements to a remarkably low figure
- 4 It costs less than one cent a ton, including all costs, to reduce bituminous coal from lump to stoker size
- 5 Simplicity of construction and operation—accessibility at all times, and real flexibility on the job all point to economy for you.

AMERICAN PULVERIZER COMPANY 1119 MACKLIND AVENUE
ORIGINATORS AND MANUFACTURERS OF RING CRUSHERS AND PULVERIZERS
ST. LOUIS, MISSOURI



A DOUBLE-DUTY DEMING PUMP

Job No. 1 is to remove water from working areas and track swags

Job No. 2 is to spray that water on roadways to allay dust

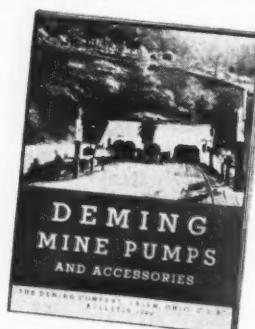
The Deming Self-Priming Centrifugal Pump illustrated is connected to a water box which is mounted on an 8-wheel Watt truck. This permits rapid movement of equipment from point to point along track for mine gathering service. Water so gathered is pumped into box then sprayed along roadways to allay dust.

Free flow of water is assured as there are no tanks, built-in strainers, hand-operated controls, or other mechanisms used for priming which is completely automatic with no adjustments required.

This type of Deming Self-Priming Mine Gathering Pump can be furnished direct connected through flexible couplings to electric motors or gasoline engines, or with pulley for belt drive. Capacities from 600 to 18,000 gals. per hour blanket a wide range of requirements.

Write for Bulletin 1000 which illustrates and explains various types of Deming Mine Pumps.

THE DEMING CO.
SALEM, OHIO



DEMING Mine Pumps

The greatest help a coal mining man can have—

IF YOU want to make sure of getting your certificate of competency—sure of winning a bigger job with bigger pay, get Beard's great books today and put them to work for you.

In these three books you have a practical, always-on-the-job guide that will help you solve the problems you face every day, show you what to do, tell you why it should be done.

Beard's Mine Examination Questions and Answers!

3 volumes — \$7.50, payable in four monthly payments

THESE books explain what a man must know in order to become a mine inspector, a mine foreman, assistant foreman, fireboss, hoisting engineer, safety engineer, shot-firer, etc.

They give you complete and authoritative information about air and gases, explosives, safety requirements and methods, mechanics, engines, hoisting, drainage, pumping, ventilation, timbering, instruments, and every other detail that the practical mining man must know.

Can you answer these questions—

What is meant by splitting the air current and what are the advantages derived from such methods?

Can a miner live in air in which the oxygen content is reduced to 17 per cent?

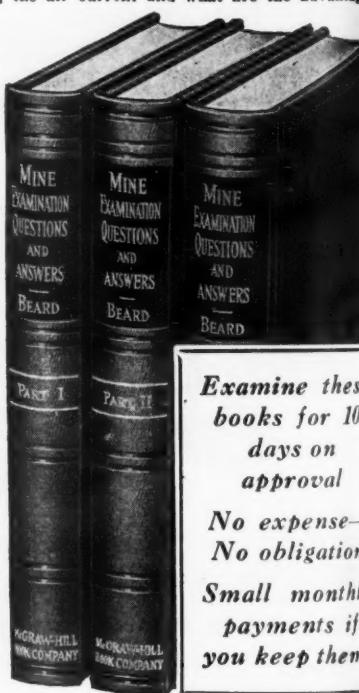
Name five duties imposed on mine foremen by law?

In what time can an engine of 40 effective hp. pump 4,000 cu. ft. of water from a shaft 360 feet deep?

What are the advantages and disadvantages of a gasoline pump, an air pump and an electrical pump?

What is the estimated tonnage per acre, per foot of thickness, for bituminous coal?

These are but a few of the more than 2000 questions given in Beard's books together with full correct answers. Hundreds of men have used this method to prepare for higher, better jobs. You can too, if you have the Beard books and plan to use them systematically. They are the best investment that a mining man can make—not only as an aid for passing examinations but as practical reference volumes on everyday mining operations.



Examine these books for 10 days on approval

No expense—
No obligation

Small monthly payments if you keep them!

McGRAW-HILL ON-APPROVAL COUPON

McGraw-Hill Book Co., Inc., 330 W. 42 St., New York 18, N. Y. Send me, charges prepaid, Beard's Mine Examination Questions and Answers, 3 volumes, for 10 days' examination. If satisfactory I will pay \$7.50 at the rate of \$1.50 in ten days and \$2.00 per month. If not wanted I will return the three volumes postpaid.

Signature

Address

City and State

Company

Position

C. 9-45

These Roof Timber Supports Save Time, Space and Increase Safety!



Available in 8 sizes: 30" to 72", in 6" units.
Style M-8 is 8-ton capacity, M-16 is 16-ton capacity.
Four types of heads: swivel (shown);
"V" for round timbers; "C" for square or
round timbers; "FF" for I-beams and rails.

Simplex Mine Roof Jacks can be quickly screwed into place against a timber, beam or rail in far less time than it takes to wedge a post in place. These jacks take less space and weigh less than posts, are less likely to be knocked out and have a known load capacity. Painted aluminum for better visibility.

Templeton, Kenly & Co.

Chicago (44), Illinois
Better, Safer Jacks Since 1899

Get Out More Coal!

Simplex Jacks prevent accidents, thereby increasing man-hours. There's a Simplex Jack for every mining requirement. Ask for Bulletin "Mines-42."

Simplex
LEVER SCREW HYDRAULIC
Jacks

FLEXIPIPE
The improved flexible tubing for
mine and tunnel ventilation

This flexible air tubing is ready for immediate, easy installation. With our NEW ROPE SEAM SUSPENSION it can be put up or taken down in a fractional part of the time required by other means of face ventilation.

Write for free sample and full information.

BEMIS BRO. BAG CO.
ST. LOUIS, MO.

**PERFORATED METAL
COAL MINING SCREENS**
Manufactured exactly to your specifications
Any size or style screen, in thickness of steel
wanted with any size perforation desired.
We can promptly duplicate your present screens at lowest prices.

CHICAGO PERFORATING CO.
2445 West 24th Place
CHICAGO, ILLINOIS
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A NAME AND A BEARING THAT WEAR WELL

Specialists in Bronze Bearings and Bushings for
Coal Mining Equipment.

Specific formulae de-
signed to best serve
each requirement.

Pioneers in Superior
High Lead Bronzes and
Alloys.

Parts for Jeffrey, Goodman, Westinghouse, General
Electric, Sullivan, Joy Equipment, etc.

THE AMERICAN CRUCIBLE PRODUCTS CO.
1307 Oberlin Ave., Lorain, Ohio, U.S.A.

Prompt deliveries can usually be made from stocks maintained at
BECKLEY, W. VA., The Universal Supply Co., Corner 2nd Ave. and 2nd St. Phone 3642
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STILL IN SERVICE . . . AFTER 41 YEARS!



LIMA
LOCOMOTIVE WORKS
INCORPORATED
LIMA, OHIO

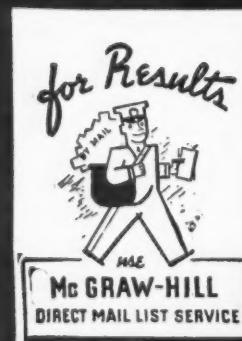
At an age when most locomotives have been retired to that limbo of obsolete power—the scrap pile—this old-timer, the "General" still wears its service stripes.

For many years after it was built-by-Lima in 1902, the "General" hauled timber from the woods adjacent to Lockhart, Alabama. Today this four-star Shay Geared Locomotive has been pressed into service at the busy

shipyard of J. A. Jones Construction Company, Brunswick, Georgia. "The venerable performer has made good, too", the present operators claim.

Here's another testimonial to the longevity and versatility of Lima-built power. For pit work, lumber operation, or other unusual hauling problems, Lima Shay Geared Locomotives provide the answer.

What



Direct Mail
Division

Makes A Mailing **CLICK?**

Advertising men agree—the list is more than half the story.

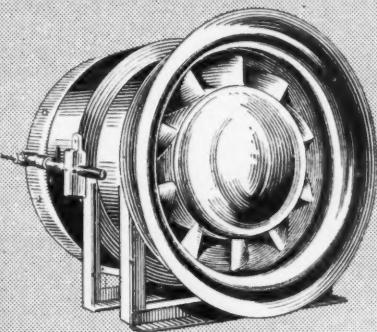
McGraw-Hill Mailing Lists, used by leading manufacturers and industrial service organizations, direct your advertising and sales promotional efforts to key purchasing power. They offer thorough horizontal and vertical coverage of major markets, including new personnel and plants. Selections may be made to fit your own special requirements.

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McGraw-Hill Publishing Co., Inc.
330 West 42nd Street
New York, N. Y.

Another **WING** Product



WING AXIAL FLOW BLOWERS

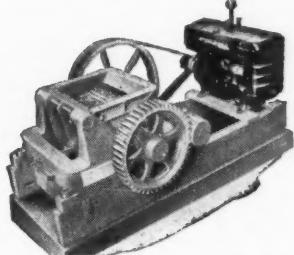
Type EMD (Single Stage)

Used for statics up to 4" with volumes up to 35,000 cfm. Higher capacities can be furnished in special designs. Built-in volume control and re-directing vanes permit simplified capacity variation either manually or automatically. Falling horsepower characteristics with damping. Motors are constant speed, fully enclosed and dustproof. Static efficiencies up to 70% and more. Uses: Forced draft for oil or gas burners, stokers, pulverized fuel, and hand-fired boilers. Mounted horizontally or vertically; on floor, or directly on windboxes or air preheaters.

L. J. Wing Mfg. Co.

55A-7th Ave., New York, N. Y.—Factories: Newark, N. J.

"BANTAM-BUSTER" COAL CRUSHERS



McLANAHAN BUILDS A TYPE AND SIZE FOR EVERY COAL CRUSHING REQUIREMENT! WRITE FOR DATA.

McLANAHAN AND STONE CORPORATION
ESTABLISHED 1835

SELL Dustless COAL USE **Dowflake**

- CLEAN AND ODORLESS
- EASY TO APPLY
- PREVENTS FREEZING
- IMPROVES CONSUMER ACCEPTANCE



THE DOW CHEMICAL COMPANY
MIDLAND, MICHIGAN
New York • St. Louis • Chicago • Houston
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Dowflake { FOR
CALCIUM CHLORIDE 77-80% DUSTLESS
COAL

HENDRICK
Carbondale 1600
for
PERFORATED PLATE
Round—Square—Diagonal—Slot
Any perforation
HENDRICK MANUFACTURING CO.
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Sales Offices in Principal Cities.
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Shaking Screens
Car Hauls, Picking Tables
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MORROW
MANUFACTURING CO. • WELLSTON, OHIO
DESIGNERS AND BUILDERS OF COAL
HANDLING EQUIPMENT FOR OVER 25 YEARS

Complete Coal Tipplers and Coal Handling Equipment

SEARCHLIGHT SECTION

EMPLOYMENT • BUSINESS • OPPORTUNITIES • EQUIPMENT—USED or RELEASE

UNDISPLAYED RATE:

10 cents a word, minimum charge \$2.00.
(See § on Box Numbers.)
POSITIONS WANTED (full or part-time individual salaried employment only), 1/2 the above rates.

PROPOSALS, 50 cents a line an insertion.

NEW ADVERTISEMENTS received by 10 A. M. September 27th will appear in the October issue, subject to limitations of space available.

POSITION VACANT

SUPERINTENDENT WANTED for mechanically equipped mine capable of producing 700 to 800 tons coal daily, located in Intermountain country. Prefer man with experience in this district. State age, experience and salary expected, also if have mining certificate in any of mountain states. P-226, Coal Age, 330 W. 42nd St., New York 18, N. Y.

POSITIONS WANTED

MINING ENGINEER with long career and widely varied experience in administrative and executive positions in the Coal industry desires connection with progressive company. Versed in all phases of the Coal business. Good health. Excellent references. Available 30 days. PW-228, Coal Age, 520 N. Michigan Ave., Chicago 11, Ill.

MINING FOREMAN or Safety Man—20 years experience, including 7 years of Mechanical Mining. Capable of handling men. Won Safety Awards. Have been with same Company for 18 years. Desires change. PW-231, Coal Age, 520 N. Michigan Ave., Chicago 11, Ill.

BUSINESS OPPORTUNITIES

STEEL MANUFACTURER will purchase outright—or manufacture on royalty basis—mining specialty. May also employ patentee or owner for sales promotion. Interested in prompt conclusion of working agreement. Write BO-226, Coal Age, 520 N. Michigan Ave., Chicago 11, Ill.

MIDWEST MINE can resume coal production quickly with few underground equipment items obtainable on used market. If desired owner will join in limited investment necessary. Green River Mine, South Carrollton, Ky. DO YOU WANT TO INVEST as Stock Holder in a Penna. Mining property with two seams high grade low volatile coal with railroad siding, opening tipple and central power, inquire BO-229, Coal Age, 330 W. 42nd St., New York 18, N. Y.

BOOKS

BOOKS—Out-of-print U. S. Geological Survey, Bureau of Mines. Lists available by states. James Howgate, Bookseller, 120 So. Church St., Schenectady, N. Y.

STRIP MINE MANAGEMENT

Complete management of your strip mine operation is now available from an experienced, capable, and efficient organization. You will be under no obligation to receive detailed information and a survey of your operation, if desired.

SS-227, Coal Age
520 N. Michigan Ave., Chicago 11, Ill.

WE LOOK INTO THE EARTH



By using Diamond Core Drills, We drill for Limestone, Gypsum, Talc, Fire Clay, Coal and all other minerals.
PENNSYLVANIA DRILLING CO.
Drilling Contractors
Pittsburgh, Pa.

DIAMOND CORE DRILLING, for any mineral. More than sixty gasoline, steam and electric drills, suitable for any job. **OUR SPECIALTY**—testing bituminous coal lands. Satisfactory cores guaranteed. Prices very reasonable.

HOFFMAN BROS. DRILLING CO.
PUNXSUTAWNEY, PA. Est. 1902 Tel. 362

FOR RENT OR SALE

Completely Rebuilt Bucyrus Erie Shovel 37B. 1½ cu. yd. with 70 ft. Crane Boom Attachment. Sale Price \$15,500.00.

FR-230, Coal Age
330 W. 42nd St., New York 18, N. Y.

INFORMATION:

BOX NUMBERS in care of any of our New York, Chicago or San Francisco offices count 10 words additional in undisplayed ads. DISCOUNT OF 10% if full payment is made in advance for four consecutive insertions of undisplayed ads (not including proposals).

DISPLAYED—RATE PER INCH:

The advertising rate is \$6.30 per inch for all advertising appearing on other than a contract basis. Contract rates quoted on request. AN ADVERTISING INCH is measured $\frac{7}{8}$ inch vertically on one column, 3 columns—30 inches —to a page. C.A.

FOR SALE

LOCOMOTIVES

- 3—10-ton General Electric, HM-809, 250 volt ball bearing motors.
- 3—10-ton Goodman, 34-B, 250 volt ball bearing motors.
- 3—10-ton Westinghouse, 907-C, 250 volt ball bearing motors.
- 2—8-ton Goodman, 132-A-O-4-C, 250 volt ball bearing motors.
- 3—8-ton General Electric, HM-819, 250 volt ball bearing motors.
- 3—6-ton Goodman Gathering, 33-I-4-T-2, 250 volt ball bearing motors.
- 7—6-ton General Electric Gathering, HM-823, 250 volt ball bearing motors.
- 5—6-ton General Electric Gathering, HM-801, 250 volt ball bearing motors.

THE ABOVE LOCOMOTIVES ARE FROM 36" TO 48" GAUGE, COMPLETELY REBUILT AND GUARANTEED

LOADING MACHINES

- 7—5-BU. JOY, 250 volt DC.
- 2—14 BU JOY, 250 volts DC.

SHORTWALL MINING MACHINES

- 5—Goodman 112C Universal Permissible Type, 250 volt.
- 6—Sullivan, CE-7, 220/440 volt, like new.

MINE CARS

- 400—3-ton, 44" gauge, end dump mine cars, 16" Timken Roller Bearing Wheels, height overall 36".

ELECTRIC HOISTS

- 1—800 H.P. Allis-Chalmers, single drum, slope hoist, 7000' of 1½" rope, 3000± rope pull, rope speed 870 FPM, 2300 volt.
- 1—500 H.P. double drum, 1600' of 1½" rope, 2300 volt, Ward-Leonard Control.
- 1—1300 H.P. Shaft Hoist with cylindro-conical drum, 1675' of 1½" rope, 2300 volt.
- 1—1300 H.P. double drum cylindro-conical drum, 900' of 1½" rope, 2300 volt.

COAL MINE EQUIPMENT SALES COMPANY

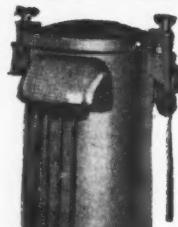
306-7 BEASLEY BUILDING L.D. Phone-34

Frank J. Wolfe

We specialize in buying completed mines that are going out of business or from receivers in bankruptcy, administrators of estates, etc.

WANTED

TRANSFORMERS— TRANSFORMERS WANTED



in operating condition or burnt out. Mail us list giving complete nameplate data and stating condition.

We Rewind, Repair and Redesign all Makes and Sizes
ALL TRANSFORMERS GUARANTEED FOR ONE YEAR

We invite your inquiries

THE ELECTRIC SERVICE CO., INC.

"AMERICA'S USED TRANSFORMER CLEARING HOUSE"
STATION M Since 1912 CINCINNATI 27, OHIO

"SEARCHLIGHT" is Opportunity Advertising . . .

- 1—to help you find what you want.
- 2—to help you sell what you no longer need.

For every business want THINK "SEARCHLIGHT" FIRST

**FOR
IMMEDIATE
DELIVERY
OF
RUBBER PRODUCTS**

Conveyor Belting...Transmission
Belting...Elevator Belting...Fire,
Water, Air, Steam, Suction or
Welding Hose, etc.

CALL, WIRE or WRITE
CARLYLE
THE
RUBBER HEADQUARTERS

**CARLYLE RUBBER PRODUCTS ARE
NEW, GUARANTEED & LOW PRICED**

CONVEYOR BELTING

ABRASIVE RESISTANT COVERS

Width	Ply	Top-Bottom	Covers
48"	8	1/8"	— 1/16"
42"	5	1/8"	— 1/16"
36"	6	1/8"	— 1/16"
30"	6	1/8"	— 1/16"
30"	5	1/8"	— 1/16"
24"	5	1/8"	— 1/32"
24"	4	1/8"	— 1/32"

Inquire For Prices - Mention Size and Lengths

TRANSMISSION BELTING

HEAVY-DUTY FRICTION SURFACE

Width Ply	Width Ply	Width Ply
18" — 6	10" — 6	6" — 5
16" — 6	10" — 5	5" — 5
14" — 6	8" — 6	4" — 5
12" — 6	8" — 5	4" — 4
12" — 5	6" — 6	3" — 4

Inquire For Prices - Mention Size and Lengths

ENDLESS "V" BELTS

"A" WIDTH All Sizes "D" WIDTH All Sizes
"B" WIDTH All Sizes "E" WIDTH All Sizes
"C" WIDTH All Sizes Sold in Matched Sets
Inquire For Prices - Mention Size and Lengths

**PROTECT THAT PLANT
FIRE HOSE**

**APPROVED SPECIFICATION HOSE
EACH LENGTH WITH COUPLINGS ATTACHED**

Size	Length	Per Length
2½"	50 feet	\$28.00
—	25 "	16.00
2"	50 "	23.00
—	25 "	13.00
1½"	50 "	20.00
—	25 "	11.00

Specify Thread On Couplings

**SPECIAL OFFER ... HEAVY DUTY
RUBBER HOSE**

WATER HOSE
Each Length with Couplings Attached
I.D. Size Length per Length

3/4"	— 25 feet	\$4.25
1"	— 50 "	8.00
—	— 25 "	6.25
1 1/4"	— 50 "	12.00
—	— 35 "	7.50
—	— 40 "	10.50
1 1/2"	— 50 "	12.00
—	— 25 "	15.00
—	— 35 "	10.00
—	— 50 "	14.00
		20.00

I.D. Size	Length	per length	Couplings
1/2"	— 25 feet	\$5.00	\$1.50 Pair
—	— 50 "	10.00	— 1.50 "
3/4"	— 25 "	6.25	— 2.50 "
—	— 50 "	12.50	— 2.50 "
1"	— 25 "	10.00	— 3.50 "
—	— 50 "	20.00	— 3.50 "

LARGER SIZES ALSO AVAILABLE
All Prices—Net—F.O.B. New York

CARLYLE RUBBER CO., INC.

62-66 PARK PLACE

NEW YORK, N. Y.

★ MINING EQUIPMENT READY FOR DELIVERY ★

CUTTING MACHINES

- 2—28-A Jeffrey, 250 volt
- 2—12-A Goodman, 250 volt
- 1—12-AA Goodman, 250 volt
- 1—23-A Jeffrey, 250 volt
- CE 2 Sullivan, 250 volt
- 1—#3 Apex Pipe Machine
- 1—#6 Apex Pipe Machine
- 2—CE 7 Sullivan, 250 volt
- A. C. Motors for Goodman standard and low vein machines

LOCOMOTIVES

- 10-Ton Jeffrey, 250 volt
- 8-Ton Westinghouse, 250 volt
- 6-Ton Ironton, 250 volt, low vein

Many other items in stock. Let us know your needs—We buy, sell and trade.

ALL-STATE EQUIPMENT CO., INC.

LOGAN, W. Va. PHONE 884

MISCELLANEOUS

- 100-KW Ridgway M-G set, 250 volt
- 24 x 24" Jeffrey coal crusher
- 2—Cameron Cent. pumps, 650 GPM, 74' head
- 1—Deming Cent. pump, 400 GPM, 70' head
- 1—100-HP Natural Gas engine with 220 volt A.C. Gen. A. C. and D. C. motors, controllers, compensators.

6 YD. or 8 YD.

STRIPPER SHOVEL

225B Bucyrus 80 ft. Boom, 54 ft. Dipper Stick, Steam Shovel.

2-4 Yds. SHOVELS

2 Marion Model, 125, Electric, 35' Boom, 25' Dipper Sticks

DIESEL DRAGLINE

3W 4W & 5W Monigham Walkers, 90 to 110 ft. booms.

3 Yd. F&H. 800, 97' boom.

2 1/2 Yd. 48B Bucyrus 80' boom.

2—2 1/2 Marion Electric Shovels.

75—1 1/2 & 2 Yd. Dump Cars.

AIR COMPRESSORS:

(7) Steam 26 ft., 300 ft., 600, 1000 & 1940 ft.

(12) Belted, 360, 676, 870, 1000, 1300 ft.

(12) Diesel 105, 315, 520, 678 & 1000 ft.

(6) Electric 1300, 1500, 2200, 2600, 5000 ft.

(14) Gasoline, 110, 160, 220, 310 & 370 ft.

COAL CRUSHERS:

Jeffrey Single Roll 18x18, 24x24 & 30x30

Link Belt 26x24 Double Roll Crusher

HYDRAULIC CARWHEEL PRESSES:

100 Ton, 150 Ton, 300 Ton, 300 & 400 Ton Caldwell - Niles - Wood - Watson Stillman

RUBBER CONVEYOR BELTS:

1000' 60", 600' 30", 300' 20", 1600' 42", 900' 48", 1450' 60", 1200' 24", 900' 18", 600' 16", 350' 14".

TANKS:

12,000 and 15,000 gal. and 20,000 gal.

CONVEYOR PARTS:

Idlers, Heads & Tail Pulleys, Steel Frames, Tripers, etc., 14" In., 60 In. Large stock here.

SYNC. MOTOR GENERATORS & ROTARYRS:

100 KW Ridgway 1200 RPM 3/60/2300-250-275

150 KW G.E. 1200 RPM 3/60/2200-250-275

200 KW Ridgway, 900 RPM 3/60/2200-250-275

3-100 KW G.E. 275 v. 1200 RPM Rotaries

STORAGE BATTERY LOCOMOTIVES:

2 1/2 ton Vt. Wt. 24 ga. New Batteries

3-4 ton G.E. 30 ga. ga.

3-5 ton Mancha 30 in. ga.

4-5 ton G.E. 36 in. ga.

3-7 ton Goodman 36 in. ga. Battery & Trolley

8-10 ton Baldwin-Westh. 42 in. & 36 in.

TROLLEY LOCOMOTIVES:

2 1/2 ton Westinghouse 24 ga.

4-6 ton & 3-5 ton Goodman, 36 ga.

3-6 ton Goodman 30 ga.

4-6 ton Goodman 42 ga.

5-6 ton Westinghouse 42 ga.

2-8 ton Goodman 36 ga.

10 ton Goodman 42 ga. & 13 ton Jeffrey

VIBRATING SCREENS:

9 Tyler Hummer 3x2, 4x5, 4x8 & 4x10

2 Robins Gyrex 4x2, 4x4

4x12 Niagara, 3x8 1/2 B., 5x6 Simplex

CARS:

60—Western 16-20-30 yd. Side Dump

SHOVELS, CRANES & DRAGLINES:

3 W 90' Boom, 6 & 160' Boom, Model 6150, 175'

Boom, Diesel, Monigham Walkers

1yd. K 30 Link Belt 50' Boom Crane

2yd. Page 70' Boom Diesel Dragline

1 1/2 yd. Marion 450' Elec. Shovel

2 1/2 yd. Lima Diesel Shovel & Dragline

2 1/2 Link Belt Elec. Shovel & Dragline

25 ton Browning 50' Boom Loco. Crane

MINE LOADERS:

Junior Joy 36 in. Low Pan

Conway 20 Mucker

3-5 BU & 7 BU 36 or 42 in. Joy

9-Goodman 200 & Jeffrey 441

7 Conway 20A, 30A, 30A, 60 & 75 Muckers

MISCELLANEOUS:

15 Ton Plymouth 36 in. Diesel Locomotive

5'x16' Traylor Rotary Dryer

6-Goodman 12CA & 12DA 6 ft. Cutters

9x8 Sullivan Mine Compressors

Clamshell Buckets 1/2, 1, 1 1/2 & 2 yd. Cap.

30 ton & 12 ton Vulcan Std. Ga. Gas. Loco.

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Complete Mines—M.G. Sets, Locomotives, Com-

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MINING MACHINES

1-12 G3 Goodman 220/3/60 AC 6' Bar.
2-12 AB Goodman 250 V. DC. 6' Bar.
1-32 B. Jeffrey 250 V. 6' Bar Bowdill #11416, with
cables.
212 G3 Goodman AC Low Veln 6' bar 6185.

STORAGE BATTERY LOCOMOTIVES

4 General Electric 6 Ton Permissible Type LSBE Class 206 Form C 9 with 2 HM 825 Ball Bearing Motors. 1/4" armplate frame, 44" Ga. (Can change to 36" ga. or less.) Each locomotive equipped with an Exide Ironclad Battery 54 cell 23 plate with 12 months of original guarantee also 1 charging Panel with each locomotive. 13 1/2" long, 50" high, 69" wide and 44" Wheel Base. Available for inspection at our Oakdale Shop.
5 Ton Ironton locomotive, Type E2, 36" Ga. with Gould Battery 23 plate with 12 months of original guarantee.
4 Ton Jeffrey 44" Ga. with Battery.

SCREENS

2-4' x 5' single deck Tyler Hammer Screens Type 37 equipped with V-16 Vibrators No. 2860 and 2867 designed for 110 v. AC 15 cy.

(Haulage)

10 Ton Westgh. 250 V. 36" or 40" Ga.
8 Ton Westgh. 250 V. 42" Ga.
2-5 Ton West. 250 V. 36 or 42" Ga./with Electric Gathering Reels. Bar steel frame.

MG SETS 3 ph. 60 cy. (Syn.)

150 KW 275 V. 1200 RPM—80 Percent PF Three Phase, 60 cycle Westinghouse.
150 KW Ridgway 250 V. DC 2200 V. AC 900 RPM.
150 KW West. 550 V. DC 2200 V. AC 900 RPM.
65 KW G.E. 250 V. DC—2200 V. AC 1200 RPM.
30 KW West. 250 V. DC—220 V. AC 1150 RPM.
22 1/2 KW Al. Ch. 125 V. DC—2200 V. AC 900 RPM.

ROTARY CONVERTERS

1-500 KW HCB Gen'l Elec. 275 v. with switchboards and Trans. 6000 or 3800 v. 3 ph. 60 cy.

ENGINE GENERATOR SETS

100 KW 250 v. DC Westgh.—Skinner Engine.
50 KW West. 125 v. DC—Skinner Engine.
25 KW Westinghouse 125 v. Steam Turbine.

SYN. MOTORS 3 ph. 60 cy.

HP Make V. Speed
75 (1) G.E. 2200 900

SLIP RING & SQ. CG MOTORS

(3 ph. 60 cy.)			
HP	Make	Speed	Wdg.
700	G.E.	393	S.R.
400	West.	500	S.C.
300	G.E.	600	S.R.
200	G.E.	720	S.R.
150	G.E.	600	IM
125	Al. Ch.	435	S.R.
100	G.E.	500	MI-25 cy.

TYPE

MT 432
C2
LM
MT 412
IM
IM
IM
MI-25 cy.

HIGH TORQUE WOUND ROTOR MOTORS (Wound Rotors)

HP	Make	V	Speed
200 (4)	G.E.	2200	61/2
150 (3)	G.E.	2200	6.0

HOISTS

75 HP Lidgerwood sgl. fr. drum
50 HP Diamond 2 drums same shaft
52 HP American 2 drum, AC Motor
30 HP Clyde sgl. drum AC Motor
30 HP Double drum—Tandem
15 HP Lidgerwood sgl. dr. AC Motor

400 TRANSFORMERS (Westgh. & GE 1 ph.)

Qu.	KVA	Pri. V.	Sec. V.
3	1	2080/2200	115/230
5	2		
100	5		
82	7 1/2		
71	10		
2	25	2200	244/438
1	30	2080/2200	115/230
3	37 Rotary	4400/185	
3	60	2200	
3	75	2200	110/220
1	100	2300	230/460
3	100 Upptegraft	400	220
1	150	3 Phase	230/460

D. C. MOTORS

200 HP Allis Chalmers 230 V. 600 RPM.
125 HP General Electric 230 V. 750 RPM.

MOORHEAD - REITMEYER CO., INC.

PITTSBURGH, PENNSYLVANIA

COAL CUTTING MACHINES

3-35B Jeffrey 250 V Shortwalls.
2-35B Jeffrey 500 V Shortwalls.
1-35BB Jeffrey 250 V Permissible Shortwall.
1-35BB Jeffrey 500 V Permissible Shortwall.
1-29LE Jeffrey T.O.H. Arcwall 250 V Permissible.
1-12AB Goodman 250 V Shortwall.
2-12A Goodman 500 V Shortwalls.
1-112EJ Goodman Permissible Shortwall 250 V.
1-12G3 Goodman AC Shortwall 3/60/220-440 V.

LOCOMOTIVES

All Steel Frames

1-13 Ton G. E. with HM-829 250 V Motors.
1-10 Ton G. E. with HM-830 250 V Motors.
1- 8 Ton G. E. with HM-839 250 V Motors.
and reel.
2- 6 Ton Jeffrey with MH-88 250 V Motors and reels.
1- 6 Ton G. E. with HM-819 250 V Motors.

ELECTRIC MOTORS

1-165 HP G. E. Syn. Motor, 3/60/2200 or 500 V. 900 RPM.
1-100 HP Crocker Wheeler Syn. Motor, 3/60/220 V. 1000 RPM.
2-50 HP G. E. Slip Ring Motors, 3/60/440 V. 600 RPM.
1-100 KW West. Type SK. 275 V. 900 RPM DC Generator.
1-100 HP West. Type CW Slip Ring Hoist Motor 3/60/2200 V. 720 RPM.
3-150 KVA Pittsburgh Transformers, 6600-220/440 V.
2-37 1/2 KVA Pittsburgh Transformers, 2200-220/440 V.
3-100 KVA G. E. Transformers, 6600-2200-220/440 V.
1-25 HP West. Type HK. 250 V Series Wound Hoist Motor, 600 RPM.

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2-Chicago Pneumatic 350 cu.ft. low pressure horizontal air compressors

1-50 horse power General Electric motor

1-Ingersoll Rand 160 portable compressor

AIR drills, AIR hammers, nail points, etc.

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ODD LOT OF NEW CAST IRON PIPE

1 Piece 6" B&S Class A 16' lengths
4 Pieces 6" B&S Class A 18' lengths
1 Piece 7" B&S Class A 9' lengths
2 Pieces 10" B&S Class A 18' lengths
1 Piece 12" B&S Class A 12' lengths
8 Pieces 14" B&S Class B 18' lengths
13 Pieces 18" B&S Class B 18' lengths

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1-One NORDBERG Hoist No. 06392, 4 ft. drum, hydraulic brake direct connected 150 h.p., G.E. motor AC, 440 v. 3 ph. 60 cycle, speed 585, complete with panel board and ammeter.

3-One POMONA Vertical Pump, 75 h.p., AC, 250 v. 60 cy. 3 ph. Westinghouse motor, together with starting compensator, capacity 1000 gal. per min., 200 feet head.

4-One ALLIS CHALMERS Pump, type BS 13406, 100 h.p., motor AC, 220 v. 60 cy., 3 ph., capacity 1000 gal. per min., 250 feet head.

All of the above equipment in first class operating condition

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- 1—CE-7 Sullivan 36" gauge
- 1—CE-9 Sullivan
- 2—7 A.U. Sullivan Track Mt'd. 550 v. DC

MINE LOCOMOTIVES

- 2—3½ ton Ironton Battery 36" ga.
- 1—6 ton Atlas 4000# D.B.P. with AC or DC Motors 36" ga.
- 1—10 ton Milwaukee Gasoline
- 1—15 ton Westinghse. 500 v. DC 40" ga., ±158 motors

ROTARY CONVERTERS

- 1—500 kw. G.E. type HC-28, 400 volt, 900 rpm, complete with transformers and switchboards
- 200 kw. G.E. 275 v. DC 900 rpm complete with transformers

HOISTS

- 100 HP. Lidgerwood 2 drum AC or DC Motor
- 1—Lidgerwood Single Drum, holds 9000 ft. 1" rope complete with 225 HP G.E. Motor

CENTRIFUGAL PUMPS

- 2—100 G.P.M. Cameron bronze, 100' hd. 8 x 8
- 1—800 G.P.M. Weinman 90' hd. 6 x 5
- 2—160 G.P.M. Deming Tripex 150# 335' hd. 6 x 8
- 1—Sterling Portable Gasoline driven

AIR COMPRESSORS

- 2—677 CFM. National Brake 2 stage 100 lb. pres. with 150 HP Westinghouse AC Syn. Motors complete

TRANSFORMERS—1 ph. 60 cy.

No. Kva.	Pri.	Sec.	Make	HP	Make	RPM	Type
1 250	2300	460	G.E.	20	Westg.	575	S
1 100	2200	110/220	G.E.	25	Triumph	1750	—
3 100	6600	550/440/220	Pgh.	25	Dukane	1150	NS-205
3 50	11430	6600	Al. Ch.	25	G. E.	775	DLC-202
3 50	6600	575	G. E.	25	Western Elec.	730	ELC
1 37	2300	220/440	Wagner	25	Westg.	1300	S
3 37	4400	185	West.(Rotary)	30	Westg.	1150	SK-110L
1 30	2200	110/220	G. E.	30	Bullock	850	—
2 30	440	220/110	West.	35	Westg.	575	S-10
35 10	2200	110/220	G. E.	35	Westg.	950	S
100 71	2200	110/220	G. E.	35	Westg.	675	SK-140
75 5	2200	110/220	West.	35	Westg.	675	SK

DIESEL ENGINE SET

- 1—217 KVA G.E. 2300/220/440 v. 3 ph. 60 cy. rpm. dir. con. to 260 HP Buckeye horiz. 2 cyl. Diesel

SLIPPING MOTORS—3 ph. 60 cy.

HP	Make	Type	Volts	RPM
1500	Westg.	CW	2200	435
700	G. E.	MT-432	2200	393
400	Westg.	CW	440/220	1170
300	Westg.	CW-1106	2200	580
300	W. El.	I-12	440/220	600
250	Westg.	CW	2200	345
100	G. E.	I	220	450
100	Westg.	CI	220/440	1750
75	Cr. Wh.		220/440	875
60	Triumph	C-16	220/440	430
60	Westg.	HF	2200	690
53	G. E.	I	220/550	1165

230 V. DC MOTORS

HP	Make	RPM	Type
20	Westg.	575	S
25	Triumph	1750	—
25	Dukane	1150	NS-205
25	G. E.	775	DLC-202
25	Western Elec.	730	ELC
25	Westg.	1300	S
30	Westg.	1150	SK-110L
35	Bullock	850	—
35	Westg.	575	S-10
35	Westg.	950	S
35	Westg.	675	SK-140
125	Morg. Gardner	425	—
150	G. E.	500	MPC-6
150	Cr. Wheeler	625	CCD
200	Cr. Wh.	477	CCD
250	Cr. Wheeler	200/400	CMC
300	Otis	550	—

(With spare armature)

SCALES

- 9—Howe No. 2784, 3 beams (2 at 200 lbs.—1 at 50 lbs.) Platform 14½ x 22", cap. 500#

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- 1—Stephens-Adamson 30" belt tripper with 3-way discharge chute.
- 1—Robins 23" Belt Tripper with 2 way chute
- 1—Mashek 36" steam jacketed horizontal mixer
- 1—Mashek 30" non-steam jacketed horizontal mixer
- 1—Mashek Briquetting Press complete with rolls; capacity 25 tons per hour
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- 1—Kennedy 125 lbs., 24" Flg. Gate Valve with 6" By-pass valve cast integral with main valve Several Kennedy 18", 20", 50-lb pressure O S & Y rising stem gate valve
- 1—Westinghouse two speed motor 7½ to 20 H.P., 430 to 870 R.P.M.
- 1—New Bristol model 311 M three pen recording thermometer with 2—45° and 1—25° leads, range 0 to 450 centigrade

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 - 1—Vulcan 30" Band friction will coil 3000 ¾" rope 50 or 60 HP motor.
 - 1—Lidgerwood 36" friction drum will coil 2000 ft. ¾" 100 HP motor.
 - 1—Connellsville 54" Band friction will coil 5000 ft. ¾" rope 100 or 150 HP motor.
 - 1—Flory-Keyed drum 58' dia. with 100 or 150 HP motor.
 - 1—Lidgerwood 60" Band friction will coil 6500 ft. 1½" rope with 200 to 350 HP motor.
 - 1—Vulcan 72" Band friction will coil 2000 ft. 1½" rope with 250 HP motor
 - 1—Vulcan 60" Sliding pinion will coil 3500 ft. 1½" rope. 200 HP motor.
 - 1—Lidgerwood-Cylindro Conical Shaft Hoist—225 ft. 1¼" rope. 300 HP motor.
 - 1—Vulcan-Cylindro Conical Shaft Hoist 350' 1¾" rope. 400 HP motor.
 - 1—Connellsville-Cylindro Conical Shaft Hoist 350' 1½" rope. 800 HP motor.
- And other hoists to suit all mining conditions

Jones Mining Equipment Co.
541 Wood Street Pittsburgh, Pa.

ROTARY CONVERTERS

- 500 KW G.E. SYN. 275 V. 6 Ph., 60 Cy., 1200 RPM. Pedestal Type, 2300/4000 V. Transformers.
- 500 KW AL-CH SYN. 275 V. 6 Ph., 60 Cy., 1200 RPM. Pedestal Type, 2300/4000 V. Transformers.
- 500 KW WEST. SYN. 275 V. 6 Ph., 60 Cy., 1200 RPM. Pedestal Type, 2300/4000 V. Transformers.
- 300 KW G.E. SYN. 575 V. HCC, 6 Ph., 60 Cy., 1200 RPM. form P., 2300/4000 V. Transformers.
- 200 KW AL-CH SYN. 275 V. 6 Ph., 60 Cy., 1200 RPM. Pedestal Type, 2300/4000 V. Transformers.
- 150 KW G.E. SYN. 275 V. HCC, 6 Ph., 60 Cy., 1200 RPM, form P., 2300/4000 V. Transformers.

MOTOR GENERATORS

- 500 KW G.E. SYN. 600 V., 2300/4000 V., 3 Ph., 60 Cy., 1200 RPM. Manual Switchgear.
- 200 KW G.E. SYN. 275 V., 2300/4000 V., 3 Ph., 60 Cy., 720 RPM. Manual Switchgear.
- 200 KW G.E. IND., 600 V., 2300/4000 V., 3 Ph., 60 Cy., 1200 RPM. Manual Switchgear.
- 200 KW R.W. SYN., 275 V., 2300/4000 V., 3 Ph., 60 Cy., 900 RPM, 80% F.F. Manual Switchgear.

LOCOMOTIVES

- 13-T WESTGHE, 250 V., 908-C Mts., 36°-44° Ga.
- 10-T WESTGHE, 250 V., 907-C Mts., 36°-44° Ga.
- 10-T WESTGHE, 500 V., 907-C Mts., 36°-44° Ga.
- 8-T JEFFREY, 250 V., MH-85 Mts., 24°-36° Ga.
- 8-T WESTGHE, 250 V., 906-C Mts., 36°-44° Ga.
- 8-T WESTGHE, 500 V., 906-C Mts., 36°-44° Ga.
- 8-T GOODMAN, 250 V., 132-A Mts., 36°-44° Ga.
- 6-T WESTGHE, 250 V., 904-C Mts., 36°-44° Ga.
- 4-T WESTGHE, 250 V., 902-C Mts., 36°-44° Ga.

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- 1—I-R Portable Air Compressor.
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- Meters: 5 Ampere, 110 Volt, 2-wire.
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5 Goodman automatic Duckbills, Type A-1-G. In very good condition.

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Sullivan CE7 Shortwall and CH8 Longwall—AC and DC. These machines have been completely gone over and are ready for instant service.

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- 3 phase, 60 cycle, for 220 or 440 volt.

1-11 HP 685 RPM	1-35 HP 580 RPM
1-15 HP 1200 RPM	1-37 HP 540 RPM
1-15 HP 580 RPM	1-37 HP 570 RPM
3-15 HP 900 RPM	1-37 HP 680 RPM
1-20 HP 1150 RPM	2-52 HP 690 RPM
1-35 HP 720 RPM	1-80 HP 600 RPM

Send us your motor inquiry, so we can furnish complete information and quote.

We also have several thousand dollars worth very carefully selected used parts for Sullivan and Goodman machines, and some new parts—Send for a complete itemized list.

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- 55 KW Westinghouse 125 Volt, 440 amp., 850 RPM
- 100 KW Goodman 250 volt, 364 amp., 600 RPM

GASOLINE MOTOR GENERATOR

- 50 KW, 230 volt, Sprague DC

Generator with switchboard, driven through flat belt by Wisconsin, 75 HP Power Unit.—this outfit excellent for use with one of the above DC Mining Machines.

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- 1-American 41 ton, 4 wheel, saddle tank Locomotive, electric lights, steam brakes, ASME Boiler, 190 lbs. Sal. or rent.
- 1-Lima 80 ton, six wheel, Switcher with tender, National Board boiler, 200# working pressure, super heater, automatic lubrication; excellent condition, immediate delivery.
- 1-American 68 ton, 6 wheel, Switcher with tender, electric lights, air brakes, power reverse, overhauled.
- 2-Vulcan 20 ton, 4 wheel, saddle tank, standard gauge, air brakes, ASME code boiler.
- 1-Vulcan 14 ton, 4 wheel, saddle tank, 36" gauge, cylinders 9 x 14, ASME boiler.

LOG WASHER

- 1-Allis Chalmers 25 ft., heavy duty, Hutch type, Log Washer, with steel tank, $\frac{3}{8}$ " plate, with two logs with paddles, 35" diameter.

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SEARCHLIGHT SECTION

LOCOMOTIVES

Goodman: All 250 volts.
1—10 ton, 31-1-4-T.
1—6 ton, 30B, 48" 1—5 ton.
1—5 ton, W-1-2, 36".
1—4 ton, 8-30.

Westinghouse: All 250 volt.
1—4 ton, 902, 48" 1—18 ton, 102, 42"
1—904 c. 44" 500 volt. Also 906 motors.
1—10 ton, 915.

G.E.: All 250 volt. 4 ton 1022, 41, as is
6 ton 803, 44", as is 5 ton 825, 44"
6 ton 823, 44" 8 ton 839 motors
6 ton 801
8 ton 839

Jeffrey: 6 ton, and 4 ton, all gauges, 250 volt
Jeffrey MH 110 Locomotives
Jeffrey MH 100

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MINING MACHINES

Jeffrey: 35B, 29B, and 4—28A, 250 V. 2—29C with drop bar support.
Goodman: 12A, 12AB, 12AA, 12G3A, 34B, 1—12G3 250 volt and 2—112 DA, 500 volt.
2—Permissible Type 12CA. 6—112AA, 1—124AA.

Sullivan: CE7, CE9, CE10, CR10 Low Vein.

SUBSTATIONS—275 VOLTS, D. C.

2—200 KW GE Rotaries (600 volt)
1—200 KW Ridgeway M.G. Set.
1—200 KW G.E. Rotary Converter.
1—200 KW West. Rotary.
1—150 KW West. Rotary.
1—200 KW, 1—100 K Ridgeway M-G Sets.
1—150 KW Ridgeway Rotary.
1—150 KW West. Rotary converter.
1—100 KW West. M-G Sets.
1—90 KW G.E. Rotary.

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Wyckoff Wood Pipe has an 88 year record of perfect resistance to the corrosive action of sulphurous mine water. It is an ideal, long-time investment—light, easy to lay, and relatively low in first cost.

We also manufacture a special Hard Maple Pipe for flushing culm in the Anthracite Region and wood covering for underground steam lines.

Established
1855



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The Originators of Machine Made Wood Pipe

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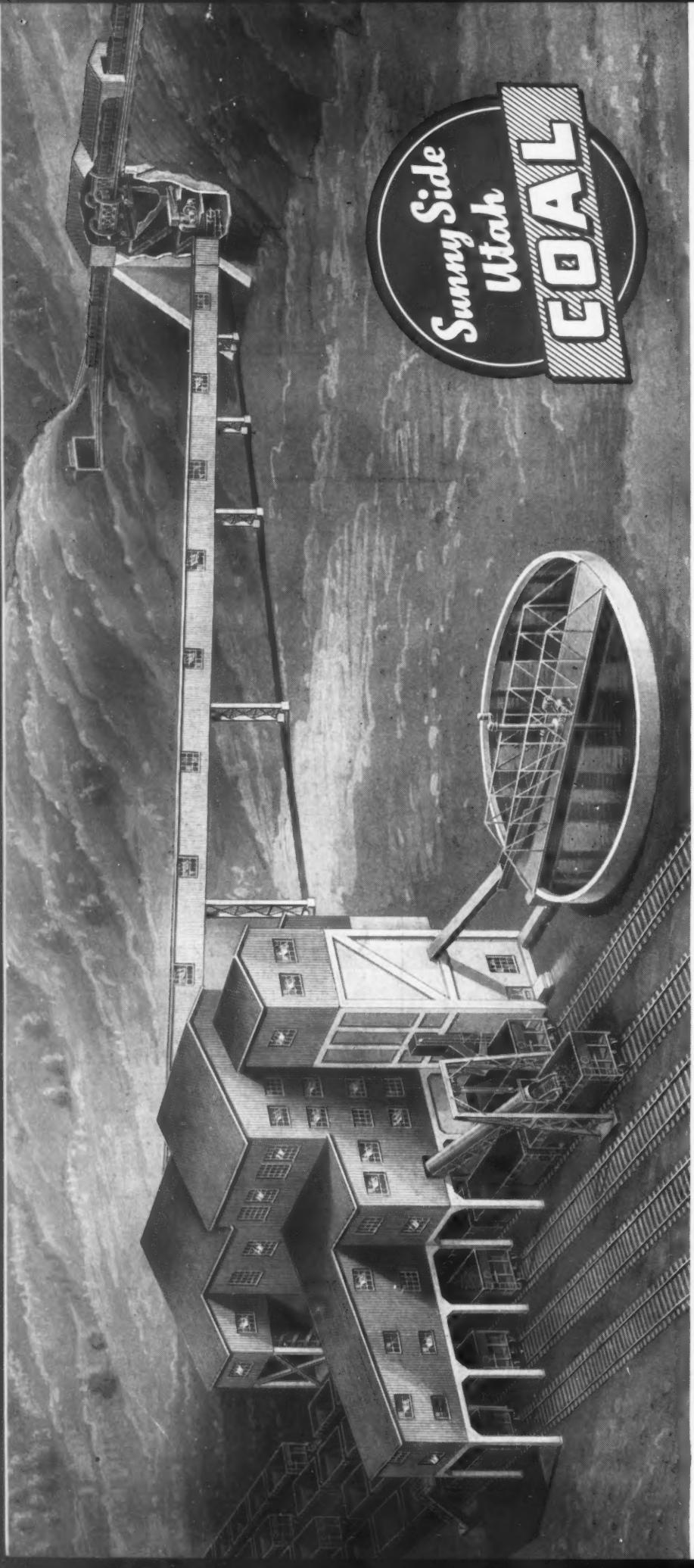
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Utah Fuel Co. Modernizes Sunnyside Preparation

● Utah Fuel Co.'s second completely modern Link-Belt preparation plant is now under construction at Sunnyside, Utah. Their first, put in service early in 1940, has produced outstanding results in cleaning, drying, sizing, blending and loading their famous Castle Gate coal.

The fine performance of this plant led them to again select Link-Belt to design and build the plant illustrated above, for preparing the output of two mines in the same seam at Sunnyside. Some of this coal will go to the by-product coke ovens at the steel mill of Kaiser Co., Inc., located at Fontana, California, some will be coked at Sunnyside and the balance prepared for domestic, commercial and steam markets.

The overall capacity of the plant is 380 tons of r.o.m. per hour, with washing (Link-Belt air pulsated washer) provided to the extent of 250 t.p.h. of minus 3", which will be classified after cleaning, into a number of sizes.

Two rotary dumpers set over a common hopper can handle coal from the two mines simultaneously or separately, as desired. A Link-Belt crusher below the hopper reduces the raw coal to 6" and below, before going to the preparation plant where facilities are provided for cleaning, drying, sizing, blending and loading.

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